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SECTION C

ATTACHMENT 2

**STATEMENT OF WORK
FOR
FACILITIES MAINTENANCE SERVICES**

SOW NNA08226867R

**NASA AMES RESEARCH CENTER
MOFFETT FIELD, CALIFORNIA 94035-1000**

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LIST OF ACRONYMS

24/7	Twenty Four Hours Per Day/Seven Days Per Week
4D	4 th Dimension, a Relational Database Management System
ABS	Acrylonitrile Butadiene Styrene
ACAP	Ames Commute Alternative Program
ACI	American Concrete Institute
ADP	Automated Data Processing
AHB	Ames Handbook
ALIS	Ames Locator Information System
AM or am	Used to designate the time from midnight to noon
AMI	Ames Management Instructions
ANN	Annual
ANSI	American National Standards Institute
AOI	Area of Investigation
APD	Ames Policy Directive
APR	Ames Procedural Requirements
ARC	Ames Research Center
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
AWS	American Welding Society
AWWA	American Water Works Association
BAAQMD	Bay Area Air Quality Management District
BCDC	Bay Conservation and Development Commission
BMAR	Backlog of Maintenance and Repairs
BEAPs	Building Emergency Action Plans
BHMA	Building Hardware Manufacturer's Association
BP	Bid Package
CA	(1) California (2) Critical Alarm
CADD	Computer Aided Design and Drafting
CCR	California Code of Regulations
CCTV	Closed Circuit Television
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFC	Chlorofluorocarbons
CFR	Code of Federal Regulations
CH	Craft Hour
CHUP	Craft Hour Unit Price
CIP	Cast Iron Pipe
CLIN	Contract Line Item Number
CMAR	Contractor Monthly Accident Report
CMMS	Computerized Maintenance Management System
CO	Contracting Officer
CON'T	Continued
COTR	Contracting Officer's Technical Representative
CPFF	Cost Plus Fixed Fee
CPIF	Cost Plus Incentive Fee
CPIFPS	Cost Plus Incentive Fee Pricing Schedule
CTI	Cooling Tower Institute
CTO	Contract Task Order
CTOR	Contract Task Order Request
DART	Disaster Assistance and Rescue Team
dB	Decibels
DBA	Davis-Bacon Act
DBH	Diameter at Breast Height
DEC	Digital Equipment Corporation

DIP	Ductile Iron Pipe
DIPEC	Defense Industrial Plan Equipment Center
DMV	Department of Motor Vehicles
DOB	DART Operations Building
DOD	Department of Defense
DoE	Department of Energy
DOSH	Division of Occupational Safety and Health
DOL	Department of Labor
DTSC	Department of Toxic Substance Control
DUCT	Damage and Utility Control Team
DWV	Drain, Waste, and Vent
EA	Each
EDC	Engineering Document Control
EDMS	Electronic Document Management System
ESH	Environmental Safety and Health
EIR	Environmental Impact Report
EIS	(1) Emergency Information System (2) Environmental Impact Statement
EO	Executive Order
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
ER	Emergency Response
ERT	Emergency Response Team
EST	Estimate or Estimated
FAA	Federal Aviation Administration
FAR	Federal Acquisition Regulation
FEMA	Federal Emergency Management Agency
FEMP	Federal Energy Management Program
FEPCA	Federal Environmental Pesticide Contract Act
FFP	Firm Fixed Price
FLR	Floor
FMCS	Facility Management Control System
FMEA	Failure Modes and Effects Analysis
FMM	Financial Management Manual
FPPS	Fixed Price Pricing Schedule
FS	Federal Specification
FSM	Facility Service Manager
FTE	Full Time Equivalent
GFE	Government Furnished Equipment
GFF	Government Furnished Facility
GFM	Government Furnished Material
GIS	Geographic Information System
GPM	Gallons Per Minute
GSA	General Services Administration
HAZMAT	Hazardous Material
HCFC	Hydrochlorofluorocarbons
HICS	Hazardous Material Inventory Control System
HSPD-12	Homeland Security Presidential Directive 12
HVAC/R	Heating, Ventilation, Air Conditioning, and Refrigeration
IAE	Installation Accountable Equipment
IAF	Installation Accountable Facilities
IAM	Installation Accountable Materials
IAP	Installation Accountable Property
ID	Identification
IDIQ	Indefinite Delivery Indefinite Quantity
IDIQPS	Indefinite Delivery Indefinite Quantity Pricing Schedule
IFR	Instrument Flight Rules
IN or in	Inches

IPM	Integrated Pest Management
IPO	Industrial Property Officer
IQ	Indefinite Quantity
IRIS	Incident Reporting Information System
ISA	International Society of Arboriculture
JCM	Code for Plant Engineering Branch at ARC
JS	Code for Logistics & Documentation Services Division at ARC
JIT	Just-In-Time
JQ	Code for Environmental Management Division at ARC
KCMA	Kitchen Cabinet Manufacturer's Association
KW	Kilowatt
LB	Pound
LDEM	Lifting Devices and Equipment Manager
LEED	Leadership in Energy and Environmental Design
LF	Linear Feet
LT	Lot
M&R	Maintenance and Repair
MA	Maintenance Alarm
MAC	Moffett Airfield Complex
MADR	Maximum Allowable Defect Rate
MEW	Moffett-Ellis-Whisman
MFG	Manufacturer
MHA	Moffett Housing Annexes
MO	Month
MSDS	Material Safety Data Sheets
MWS	Monthly Work Schedule
NASA	National Aeronautics and Space Administration
NEC	National Electric Code
NEIS	NASA Environmental Inventory System
NEMS	NASA Equipment Management System
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NFS	NASA FAR Supplement
NHB	NASA Handbook
NIB	National Institute for the Blind
NIC	Not In Contract
NISH	National Institute for the Severely Handicap
NMI	NASA Management Instructions
NPD	NASA Policy Directive
NPDM	NASA Property Disposal Management System
NPR	NASA Procedural Requirements
NRCA	National Roofing Contractors Association
NRP	NASA Research Park
NSMS	NASA Supply Management System
NSS	NASA Safety Standard
OEM	Original Equipment Manufacturer
OMFIT	Operations and Maintenance of Facilities Innovations Team
OSHA	Occupational Safety and Health Administration
PBC	Performance Based Contract
PC	Personal Computer
PCB	Polychlorinated Biphenyl
PDA	Personal Data Assistant
PdM	Predictive Maintenance
PDO	Property Disposal Officer
PE	Polyethylene
PF	Code for Facilities Engineering and Real Property Management Division at ARC
PG&E	Pacific Gas and Electric Company
PIP	Phase-In Period

PM	Preventive Maintenance or Preventative Maintenance
PM or pm	Used to designate the time from noon to midnight
POTW	Publicly Owned Treatment Works
ppm	Parts Per Million
PRS	Performance Requirements Summary
PSS	Pricing Schedule Summary
PT&I	Predictive Testing and Inspection
PVC	Polyvinyl Chloride
PWO	Project Work Order
QA	Quality Assurance
QAE	Quality Assurance Evaluator
QC	Quality Control
QCP	Quality Control Plan
QH	Code for Occupational Safety, Health, and Medical Services Division at ARC
QP	Quality Plan
QTY	Quantity
RAM	Random Access Memory
RCM	Reliability Centered Maintenance
RCP	Reinforced Concrete Pipe
RCRA	Resource Conservation and Recovery Act
RFP	Request For Proposal
RIEI	Roofing Industry Educational Institute
RPM	Revolutions Per Minute
RWQCB	Regional Water Quality Control Board
SBA	Small Business Administration
SCA	Service Contract Act
SCH	Schedule or Scheduled
SEMO	Supply and Equipment Management Officer
SF	Standard Form or Square Feet
SHPO	State Historic Preservation Office
SI	International System of Units
SOW	Statement of Work
SR	Service Request
Subclin	Subcontract Line Item Number
TBD	To Be Determined
TC	Trouble Call(s)
TDS	Total Dissolved Solids
TPHD	Total Petroleum Hydrocarbons As Diesel
TRL	Technical Reference Library
TSCA	Toxic Substances Control Act
UBC	Uniform Building Code
UFC	Uniform Fire Code
UL	Underwriter's Laboratories
UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
UPS	Uninterrupted Power Supply
UPT	Unit Priced Tasks
URCP	Unreinforced Concrete Pipe
US or U.S.	United States
U.S.C.	United States Code
USC	University of Southern California
USDA	United States Department of Agriculture
USGBC	United States Green Building Council
VPP	Voluntary Protection Program

SECTION C1**GENERAL INFORMATION AND REQUIREMENTS****C1.1 INTRODUCTION**

The requirement of this work statement is to obtain integrated facilities maintenance services for Moffett Field, California by means of a hybrid contract consisting of Firm Fixed Price (FFP), Indefinite Delivery Indefinite Quantity (IDIQ) that will be issued on a Firm Fixed Price basis, and Cost Plus Fixed Fee (CPFF) contract work. The objective is to obtain reliable and cost effective services by applying a sound management and technical approach that will provide the best value and meet requirements shown in this work statement.

The majority of work under this contract will be FFP work. The FFP work consists of: (1) responding to trouble calls (TC), tracking, and documentation; (2) accomplishing recurring services such as preventive maintenance (PM) that involves routine periodic maintenance, incidental repair requirements associated with facilities, utility systems, dynamic equipment for which no specific operators are assigned, and performing Predictive Maintenance (PdM) that includes Testing and Inspection (PT&I) of equipment and systems and Failure Modes and Effects Analysis (FMEA); (3) operations that involve attendance type work requiring the presence of qualified person(s) during a specified time period; (4) maintenance engineering services; and (5) adverse weather condition response support. IDIQ work consists of Craft Hour Unit Price (CHUP) work that cannot be adequately quantified until a Contract Task Order (CTO) is issued, and then becomes a fixed price order once approved. All repair work exceeding the TC limit, defined in Section C5.2, Firm Fixed Price Work; Trouble Calls, is not a part of this contract, unless the failure of equipment or services is directly caused by the Contractor's failure to perform necessary requirements. Work beyond the TC scope may be ordered as part of the IDIQ portion of this contract. CPFF work, detailed in Section C20, consists of Environmental and Emergency Support Services.

C1.2 SCOPE OF WORK

C1.2.A General. The Contractor shall provide all resources, including labor, supervision, tools, equipment, materials, spare parts, maintenance engineering, transportation, and management necessary to operate, maintain, and repair the facilities and utilities specified herein, and to perform alterations and specialized functions as described herein at Moffett Field, except as noted in Attachment 2.03, Section J. Moffett Field consists of the National Aeronautics and Space Administration (NASA) Ames Research Center (ARC), Moffett Airfield Complex (MAC) including the NASA Research Park (NRP), and Moffett Housing Annexes (MHA) 1 (Berry Court), 2 (Orion Park), and 3 (Shenandoah Square). The scope of this contract covers the following: (1) All paved and landscaped surfaces, buildings, structures, and services at ARC; (2) all utility distribution systems and landscaping within the perimeter fence of Moffett Field as defined in Section C2, Definitions; (3) designated buildings, structures, and services for MAC as specified throughout Section C; and (4) designated services for MHA2 as specified throughout Section C.

C1.2.B Maintenance Services. The Contractor shall provide specific services for the following maintenance and construction functions defined in the NASA Facilities Maintenance and Operations Management NPR 8831.2E. All work is FFP or IDIQ, except for Section C20, which is CPFF.

C1.2.C Working Hours. For the purposes of this contract, the Government's regular (normal) working hours range from 0600 to 1730 hours (6:00 AM to 5:30 PM), Mondays through Fridays, except (a) Federal holidays and (b) other days specifically designated by the Contracting Officer. Swing shift or second shift shall mean a range between the hours of 1500 to 0200

hours (3:00 PM to 2:00 AM). Night shift or graveyard shift shall mean a range between the hours of 2300 to 0730 hours (11:00 PM to 7:30 AM).

C1.2.C.1 The Government's working hours will often extend beyond regular working hours for trouble call (TC) work, boiler plant operational requirements, flight operations support for MAC, NASA Research Park (NRP) support, infrastructure improvements and renovations, environmental and emergency support services, and various research projects and programs related to NASA's mission and goals.

C1.2.C.2 The Contractor shall provide 24/7 coverage for Customer Service Center and Facility Management Control System (FMCS) functions under this contract.

C1.2.D Contractor Quality Control (QC).

C1.2.D.1 The Contractor shall establish and maintain a Quality Control Program in accordance with the FAR 52.246-4, "Inspection of Services - Fixed Price" clause, Section E, to ensure that the work performed under the contract conforms to the contract requirements. The Contractor shall submit a Quality Control Plan (QCP) annually to the Government. The Contractor's QCP shall provide Contractor management with an effective and efficient means of identifying and correcting problems throughout the entire scope of operations and will become a part of the contract as an Attachment.

C1.2.D.2 A file of all inspection records both performed and scheduled, inspection results, dates, and details of corrective actions taken shall be maintained by the Contractor through the term of this contract. All files shall be the property of the Government and made available to the COTR during regular working hours. The files shall be turned over to the Contracting Officer within five (5) working days following completion or termination of this contract.

C1.2.E Government Quality Assurance (QA).

For FFP and IDIQ Work (SOW Sections C1-C19): In accordance with the FAR 52.246-4, "Inspection of Services - Fixed Price" clause, Section E, each phase of the services rendered under this contract is subject to Government inspection, during the Contractor's operations and after completion of the tasks. The Government's QA Surveillance Program is not a substitute for QC by the Contractor. All findings of unsatisfactory or non-performed work will be administered in accordance with the "Consequences of Contractor's Failure to Perform Required Services" clause of Section E.6. All costs associated with rework are the responsibility of the Contractor. The Government reserves the right to choose the inspection methods, define its own Predictive Testing and Inspection (PT&I) program to be used in implementing its QA Program, contract out for inspection services, and vary the inspection methods utilized during the work, without notice to the Contractor. Additionally, the Government intends to use PT&I methods and results during Government surveillance to assist in documenting Contractor performance of the PM program. All PT&I results and other inspection documentation will be made available to the Contractor as the data becomes available. Inspection results will be used by the Government as evaluation documentation in determining monthly payments to the Contractor for items listed in the Schedule of Deductions, Section E, and any applicable IDIQ work performed during the month.

For CPFF Work (SOW Section C20): In accordance with the FAR 52.246-5, "Inspection of Services - Cost-Reimbursement" clause, Section E, each phase of the services rendered under this contract is subject to Government inspection, during the Contractor's operations and after completion of the tasks. The Government's QA Surveillance Program is not a substitute for QC by the Contractor. All findings of unsatisfactory or non-performed work will be administered in accordance with the "Consequences of Contractor's Failure to Perform Required Services" clause of Section E.6. If any of the services performed do not conform to contract requirements, the Government may require the Contractor to perform the services

again in conformity with contract requirements, for no additional fee. The Government reserves the right to choose the inspection methods to be used in implementing its QA Program, and vary the inspection methods utilized during the work, without notice to the Contractor. Inspection results will be used by the Government as evaluation documentation in determining payments to the Contractor. Any deductions involving CPFF work will be documented and taken from the fee portion of the contract annually.

C1.2.F Workmanship and Materials Standards.

C1.2.F.1 Workmanship. All workmanship shall meet the standards specified herein and shall be accomplished in conformance with approved and accepted standards of the industry; equipment manufacturers; Federal, State, and local standards; NASA directives; and all applicable building and safety codes unless otherwise stated by NASA.

C1.2.F.2 Work Completion. When the Contractor completes work on a facility, system, or piece of equipment, that facility, system, or equipment shall be free of missing components or defects preventing it from functioning as originally intended and designed. Corrective repair and replacement work shall be carried to completion including operational checks, acceptance testing, and cleanup of the job site. Except where otherwise noted, all replacement materials shall match existing dimensions, finish, color, design, and intended function.

C1.2.F.3 Cleanup. During and at completion of work, debris shall not be allowed to spread unnecessarily into adjacent areas nor accumulate in the work area itself. All such debris, excess material, and parts shall be cleaned up and removed at the completion of the job and/or at the end of each day work is in progress. All hazardous materials shall be stored, used, and disposed of in accordance with Section C20, Environmental and Emergency Support Services.

C1.2.F.4 Equipment Under Manufacturer's or Installer's Warranty. Equipment, components, and parts, other than that installed under this contract, shall not be removed or replaced or deficiencies corrected while still under warranty of the manufacturer or the installer without prior approval of the COTR, except for critical trouble call situations that require immediate action to arrest the emergency condition. All defects in material or workmanship, defective parts, or improper installation and adjustments found by the Contractor shall be reported to the COTR so that necessary action may be taken. The Contractor shall be knowledgeable of the equipment, parts, and components that are covered by warranty and the duration of such warranties. Available warranty information will be furnished to the Contractor by the COTR. The COTR may elect not to honor the installers' warranty and choose to have the repair completed by the Contractor.

C1.2.F.5 Damages Caused by Weather Conditions or Vandalism. Work required to repair facilities or equipment damaged by inclement weather conditions or acts of vandalism, shall be performed by the Contractor if such work is within the scope of a TC. The Contractor's liability shall be the TC limit per incident. Work exceeding the TC limit as defined in Section C5.2, Firm Fixed Price Work; Trouble Calls, shall be ordered as IDIQ items per Section C7, Indefinite Delivery Indefinite Quantity Work.

C1.2.G Variation in Quantities for Fixed Price Services. Quantities and inventory data depicted throughout this contract represent the Government's best estimate of the quantity of work for the period of performance. After contract award, situations may arise which impact upon the Government's requirements and necessitate changes to this contract. Should this occur, the Contracting Officer will modify the contract in accordance with the provisions and limitations specified herein. No adjustments shall be made under the following provisions, except as may be specifically identified. Should other provisions in Section C conflict with the provisions provided herein, the other provisions shall take precedence.

C1.2.G.1 Firm Fixed Price (FFP) Work.

C1.2.G.1.a Minimum Amounts. If the Government reduces the annual quantity of work for any item of fixed price work to an amount between 80 to 100 percent of the original quantities for each type of equipment inventory identified throughout Section J, no adjustment will be made to the contract. Should the Government reduce the work below 80 percent of the original quantities identified for each type of equipment inventory throughout Section J, an annual price adjustment, with a contract modification, will be made for the work below 80 percent of the original quantity. At any time during the period of performance, the Contractor may request that the Government reduce the frequency of PM quantities by providing sound justifications in PM using PdM results, increasing efficiency of operations and processes beneficial to the Government, and showing improved alternatives or cost savings to the Government.

C1.2.G.1.b Maximum Amounts. There will be no change to the contract if the Government increases equipment inventory for each type of equipment shown in the FFP portion of Section J, to an amount up to 105 percent. Any quantity greater than 105 percent and up to 110 percent of the original quantities for each type of equipment inventory identified in Section J at the start of the contract, may be ordered by the Government at the contract IDIQ rates by issuance of a Contract Task Order (CTO). Any quantity increase greater than 110 percent of the original quantities for each type of equipment inventory identified in Section J at the start of the contract will result in a negotiated contract modification for the units and amounts affected, with the new inventory quantities becoming baseline for future adjustments.

C1.2.G.2 Trouble Calls (TC). The historical data on TC are identified in Attachment 2.05.03, Section J. The actual quantities of TC issued during each performance period will most likely differ from that shown in the historical records, but the Contractor shall be responsible for ALL TC regardless of how many are performed under this contract. No price adjustment will be made for TC within a plus or minus 20 percent range of the proposed quantities identified by the Contractor on the Fixed Price Pricing Schedules. Accordingly, an adjustment using the unit bid price per TC will be made to the contract price for those TC that were issued exceeding the proposed annual quantities by 20 percent on the Fixed Price Pricing Schedule within 30 days at the start of each contract period. A 50 percent adjustment based on the unit bid price will be made to the contract price for TC not made below the proposed annual quantities by 20 percent of the original quantity specified. For example, if the TC are reduced by 25 percent of the annual quantity specified at the start of each contract year, the total contract price for this line item will be reduced by only 2.5 percent, not five (5) percent. If the TC maximum range value is exceeded due to Contractor failure to perform regularly scheduled maintenance, the Government will make no equitable adjustment.

C1.2.G.3 Recurring Services. The annual quantity of work for all recurring services is identified throughout Section C, Section E, and in various Attachments of Section J.

C1.2.G.3.a Upon notification from the Contractor within the first 180 days of the Base Period of performance, the Government will adjust the contract price at the same unit price shown in the Pricing Schedules for errors submitted by the Contractor and validated by the Government quantities identified for recurring services in the contract. All corrected quantities shall become the quantities used for each contract year's Pricing Schedules as if they were in place at contract start date. The Contractor shall identify the specific error, the corrected quantity, and the revised price, for each contract year and for the total contract. Notification of errors after the initial 180 days will not be considered.

- C1.2.G.3.b The Government reserves the right to correct any errors in quantities and will adjust the contract price at the same unit price shown in the Pricing Schedules.
- C1.2.H Facility Location Maps and Drawings. Facility Location maps for ARC and its associated sites are provided in Attachment 2.01.04, Section J, for use in conjunction with historical workload data in planning travel time impact, accessibility, and relational distances on firm fixed price and IDIQ work described in Section C.
- C1.2.J Historical Workload Data. Government historical workload data for firm fixed price TC described in Section C5.2, Firm Fixed Price Work; Trouble Calls, and actual samples of IDIQ CTOs described in Section C7, Indefinite Delivery Indefinite Quantity Work, and actual TC are located in Attachments 2.05.03, 2.05.04, and 2.05.05, Section J, respectively. The historical workload data relates to the services and methods used in the past to provide similar services. The Contractor shall use this data cautiously to their advantage, for the Government is not contracting for this historical level of service, but for the best value package of goods and services which will provide the maximum support to the Center at the least cost. The Contractor has full authority to propose changes to the maintenance program that differ from the historical workload data.
- C1.2.K Cooperation With Other Contractors. The Government may undertake or award other contracts for additional work at or near the site of the work being performed under this contract. The Contractor shall fully cooperate with the other contractors and with Government employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the COTR.
- C1.2.L Customer Notification, Security Escorts, and Facility Access.
- C1.2.L.1 Notification. Prior to performing any work in a building, the Contractor shall provide the customer(s) of the facility or area being affected three (3) working days advance notice for all work (crane service work requires five (5) working days advance notice) other than TC and as soon as possible for TC work. A construction permit and schedule shall be posted on site when applicable prior to commencement of work and updated when scheduling changes occur. A list of Facility Service Managers (FSM) or customers for each facility will be provided by the Government, or can be obtained through the "InsideAmes" web site. Such notification shall include the date, time period, type of work to be performed, and what is affected. Should work progress temporarily halt before job completion, the Contractor shall provide the customer with the reason for delay and the projected date or time he/she will return to complete the work. If the customer is unable to be notified for emergency TC, the Contractor shall notify the COTR.
- C1.2.L.2 Escorts. The Contractor shall not perform any work in the Weapons Magazine areas or any high security areas without a customer provided security escort present at all times, 24 hours per day. The Contractor will not be subject to penalty for Government delays in security escort services.
- C1.2.M Technical Documents. After contract start, the Contractor is responsible for continuously maintaining and updating all equipment operation and maintenance documents with associated drawings in Building 510 relevant to this contract throughout the entire contract period.
- C1.2.N Existing Conditions. The Government makes no guarantee that all areas of this contract are maintained to the present level of services as required by this contract. All data supplied is assumed to be correct at the time this contract was released, but some errors may exist. Any variations will be dealt with according to the limitations discussed in Paragraph C1.2.G, Variation in Quantities for Fixed Price Services, and per the Order Limitations per Section I.6.

Existing conditions can best be determined and evaluated by the Contractor during actual site visits. Over 70 percent of existing facilities contain asbestos and approximately 50 percent contain lead paint. Some fluorescent light fixture ballasts contain PCBs. Any areas not presently maintained according to the specified standards of this contract shall be brought to the attention of the COTR for possible Government action in the future.

- C1.2.P Contractor Licensing, Certification, and Specific Experience Requirements. Licenses required of the Contractor to conduct business (i.e. local or state business licenses) shall be obtained prior to beginning work on this contract. Personnel licensing and certification shall be complete before that individual performs any work under this contract applicable to the subject licenses and certifications required. The Contractor shall submit verification of all licensing, certifications, and any specialized experience to the COTR within 7 calendar days prior to start of the Base Period, and within one (1) day upon any personnel change thereafter. All licenses and certificates shall be current, and shall be kept current throughout the contract period. Environmental and Emergency Support Service requirements are listed in Section C20.

The Contractor shall provide personnel that have the appropriate skill for that trade. The degree of skill of individuals shall be commensurate with that required for the work. All apprentices shall be supervised and have work checked by the applicable lead journeymen in their particular field. This requirement applies to all crafts. Journeymen requirements are defined in Section C2, Definitions.

- C1.2.P.1 Heating, Ventilating, Air Conditioning, and Refrigeration (HVAC/R). The Contractor shall provide mechanics or technicians performing work on refrigerated circuits and refrigerant containing devices who all are EPA certified per Section 608 of the Clean Air Act, and shall provide certification that all service practices maximize recycling of ozone-depleting compounds for recovery and containment of refrigerants will be followed, per set requirements. All lead mechanics or technicians working on HVAC/R equipment shall be at the journeyman level with at least four (4) years experience at that level within the appropriate trade(s). HVAC/R technicians that work with refrigerants on this contract shall hold no less than a "UNIVERSAL" level in certification. That certification shall be carried on their person at all times. In addition, at least 50 percent of all HVAC/R technicians shall have certification in the use of Air Purifying Respirators per CFR 29 1910.134. All HVAC/R workers shall be familiar with general RCM practices and procedures.
- C1.2.P.2 Apprentices, Helpers, and Limited Mechanics and Technicians. All apprentices, helpers, and limited mechanics and technicians working on the HVAC/R portion of this contract shall be under the direct supervision and guidance of a documented journeyman mechanic or technician at all times.
- C1.2.P.3 Environmental Safety and Health Management. The Contractor shall provide certified hazardous material specialists who have all been trained in hazardous waste material operations as required by NASA Safety and Health Manual requirements, Ames Environmental Procedures and Guidelines, Federal Environmental Protection Agency (EPA), pertinent Federal, State, and local regulations promulgated pursuant to the Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), and other regulations applicable to hazardous sites as identified by Title 40 of Code of Federal Regulations (See Section C20, Environmental and Emergency Support Services, for additional contract requirements).

ARC and MAC are classified as hazardous waste sites as defined in the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). All field workers who work at this site must have completed a 24-hour hazardous waste site workers training class, as defined in Occupational Safety and Health Administration (OSHA) regulations. The Contractor shall provide or make available training courses

for their employees in environmental compliance, hazardous materials, hazardous waste management, and emergency response in accordance with applicable laws.

The Contractor shall have the capability to perform limited abatement work using on-site hazardous material personnel up to 100 square or linear feet to be performed as an extension of the maintenance work activities at this site. The Contractor shall obtain all licenses, insurance, and certifications required to perform these jobs during the course of this contract.

- C1.2.P.4 Alarm Systems. All facility alarm technicians shall be trained and certified, in writing, as qualified to work on alarm systems or associated electrical devices. These qualifications shall include, but are not limited to, journeyman level workers holding current Original Equipment Manufacturer (OEM) training certificate for all access control security, fire alarm, and gas detection systems.
- C1.2.P.5 Arborist. Only certified (licensed by ISA) and trained arborists shall be authorized to direct tree pruning activities, assess hazard trees, and provide professional reports regarding assessment of the condition of the trees on the Center.
- C1.2.P.6 Electrical Distribution. All electrical work shall be performed by a qualified journeyman electrician or accomplished by apprentices, helpers, and limited electrical technicians under the direct supervision, within visual site and guidance, of a documented electrical journeyman at all times. All repair work other than maintenance items shall be performed by certified electricians with the State of California, Department of Industrial Relations, Division of Apprenticeship Standards.
- C1.2.P.7 Facility Management Control System (FMCS). The Contractor shall provide three individuals with a minimum of three (3) years working experience in FMCS operation with emphasis placed on expertise using the software provided and hardware manufactured by Siemens® (formerly Landis and Staefa®). The individuals shall be capable of performing software programming on modules applicable to the existing FMCS system and troubleshooting existing field panels and devices. Individual qualifications shall include OEM training curriculum for certification measurable to the level of qualification or experience for the work performed.
- C1.2.P.8 Plumbing. All plumbing work shall be performed by a qualified journeyman plumber or accomplished by apprentices, helpers, and limited plumbing technicians under the direct supervision, within visual site and guidance, of a documented plumbing journeyman at all times.
- C1.2.P.9 Predictive Testing and Inspection (PT&I). The Contractor shall provide a minimum of two (2) personnel who are trained in vibration analysis and thermography at a minimum of Level I certification. The Contractor shall also have personnel available trained and certified on the basics of precision balancing of rotating equipment, laser alignment, tribology, airborne ultrasonics, motor circuit evaluation (MCE), motor current spectrum analysis, and Dranetz™ operation. All certifications and training should be equivalent to or exceed that of American Society of Nondestructive Testing (ASNT) Level 1 requirements where applicable, or OEM training curriculum if no standard exists.
- C1.2.P.10 Roofing. All roofing work shall be performed by a qualified journeyman roofer or accomplished by apprentices, helpers, and limited roofing technicians under the direct supervision, within visual site and guidance, of a documented roofing journeyman at all times. The Contractor shall provide an individual with a minimum of five (5) years working experience in repairing roof systems and structures.
- C1.2.P.11 Crane Operators and Riggers. Only certified (licensed) and trained operators shall be authorized to use and operate cranes. All crane operators shall be trained and certified

by a recognized crane certification organization. Certification shall also include riggers and flagmen. Refer to NASA STD-8719.9, NASA Standard For Lifting Devices and Equipment.

- C1.2.P.12 Engineers. All engineers shall have, as a minimum, a Bachelor of Science degree in applicable engineering field conferred by an accredited school of higher education in North America, or substantially equivalent programs as recognized by the Accreditation Board for Engineering and Technology (ABET). The lead engineer shall hold a current license with the California Board for Professional Engineers and Land Surveyors, and be actively practicing in the subject field.
- C1.2.P.12.a LEED Analyst. The Contractor shall provide an individual with LEED professional accreditation as certified by the U.S. Green Building Council. This person shall have demonstrated a thorough understanding of green building practices and principles and the LEED Rating System, especially for existing buildings.
- C1.2.P.13 Drafters. All drafters shall have, as a minimum, two years of formal educational experience in drafting practices by an accredited school of higher education. In addition, the lead drafter shall have a minimum of five (5) years of professional drafting experience utilizing CADD system(s) beyond the formal educational years.
- C1.2.Q System Outages.
- C1.2.Q.1 General. The Contractor shall coordinate schedules of system outages affecting Moffett Field activities and notify the COTR prior to planned disruption of services. The Contractor shall participate in planning work that may affect installed systems for which the Contractor is responsible and may include outages by other contractors or Government entities. The Contractor shall provide knowledgeable personnel to attend outage meetings as required. The Contractor shall locate utilities through the use of Government provided Engineering Document Control (EDC) drawings, floor plans, utility prints, and through the use of a pipe or cable detectors or other acceptable methods (*i.e.* probing rods, infrared, ultrasound). The Contractor shall note utilities found at the site with fluorescent paint, wood stakes, or proper notation, and "red-line" EDC drawings, floor plans, and utility prints as discrepancies are discovered. All drawing changes shall be submitted to the Government for updating within five (5) working days from when the discrepancy was first noticed. During regular working hours, the Contractor shall notify the affected parties prior to the system being deactivated and reactivated. Affected parties may be other contractors or occupants of affected buildings. During other than regular work hour outages, the Contractor shall notify the Trouble Desk who shall, in turn, notify the proper personnel as provided by the Government.
- C1.2.Q.2 Planned Service Outages. When any work other than TC requires an outage or reduction in mechanical, electrical, utility, etc., services, the Contractor shall provide at least three (3) working days advance notice to the COTR and affected parties with exceptions noted below. Notification shall include the time the outage shall occur and an estimate of when normal service is to be resumed.
- C1.2.Q.2.a The Contractor shall provide a minimum of ten (10) calendar days advance notice to the COTR for all planned electrical outages.
- C1.2.Q.2.b The Contractor shall provide a minimum of 30 calendar days advanced notice to the COTR for planned building service outages during annual shutdowns for maintenance for the following buildings: 233, 233A, and 258.

C1.2.R Excavations. The Contractor shall locate all underground utilities and other buried structures before excavating for any work. Some direct buried telephone cables not owned by the Government exist and are not noted on NASA drawings. All utility excavations require an internal ARC permit which shall be obtained prior to excavations for all work under this contract. ARC permit forms are available from the ARC web site. The Contractor shall revise utility maps described in Paragraph C1.2.H, Facility Location Maps and Drawings, when work performed during excavations results in changes to existing conditions. All discrepancies in underground utility systems shall be documented by "red-lining" existing utility maps complete with size, type, dimensions, location, etc., and submitted to the Government for updating within five (5) working days from when the discrepancy was first noticed. The Government will issue updated maps after corrections have been made to the master utility database.

C1.2.S Monthly Status Meetings. The Contractor shall meet with the Government as needed during the first month of the contract. Thereafter, meetings will be as often as necessary at the discretion of the Contracting Officer and Contracting Officer's Technical Representative (COTR), but not less than monthly. A mutual effort will be made to resolve all problems identified and discuss any issues. The written minutes of these meetings shall be distributed to both parties in attendance. Should the Contractor not concur with the minutes, the Contractor shall state, in writing to the Contracting Officer and COTR, any areas of disagreement within five (5) working days.

C1.3 GENERAL MANAGEMENT AND CONTROL REQUIREMENTS

C1.3.A Management and Administration. The Contractor shall manage and administer the total work effort associated with facilities maintenance and repair including trouble calls (TC); recurring services including preventive maintenance (PM) and predictive maintenance (PdM); and operations required herein to assure fully adequate and timely completion of these work requirements in a safe manner that achieves the contract objectives, outcomes, and requirements described herein. Included in this function are a full range of management duties including, but not limited to, planning, scheduling, cost accounting, report preparation, establishing and maintaining records, and quality control. Note that the Contractor is given the opportunity to propose changes to the maintenance approach through the application of Reliability Centered Maintenance (RCM) principles. The Contractor shall provide an adequate staff of personnel with the necessary management expertise and maintenance engineering skills to assure the performance of the work in accordance with sound and efficient management practices adhering to NASA Facilities Maintenance and Operations Management NPR 8831.2E and NASA Reliability Centered Maintenance Guide For Facilities and Collateral Equipment.

C1.3.B Work Control. The Contractor shall implement all necessary work control procedures to fully ensure adequate and timely completion of work requirements, as well as tracking of work in progress. The Contractor shall plan, schedule, and perform maintenance engineering work to assure material, labor, and equipment are available, and safety and environmental concerns are met, to complete all work requirements within the specified time limits and in conformance with the quality standards established herein. All work requirements shall be logged daily and entered into the Computerized Maintenance Management System (CMMS). Verbal or electronic mail inquiries of status reports on work in progress or tasks completed shall be provided when requested by the COTR. The status of any item of work must be provided within two (2) hours of request during regular working hours, except as otherwise stated in this SOW or by the COTR at time of request.

C1.3.C Allowable Work Hours. All work shall be performed during regular working hours as defined in Paragraph C1.2.C, Scope of Work; Working Hours, except as otherwise specified. If the Contractor desires to perform work on Saturdays, Sundays, holidays, or outside the normal hours specified above, the Contractor must obtain approval from the Contracting Officer and

COTR for all non-fixed priced work in accordance with Section C20.7; Indefinite Delivery Indefinite Quantity Work. All requests will be granted provided that a justification is provided that does not interfere with or impact Government operations.

C1.3.D Work Schedule and Plan.

C1.3.D.1 The Contractor shall arrange work to eliminate interference with the normal occurrence of Government business. In cases where some interference is unavoidable, the Contractor shall make every effort to minimize the impact of the interference and its effects on the occupants or users. All work schedules required shall be submitted to the COTR. In no event shall the Contractor change the work schedules without notifying the COTR of impending changes. The COTR has the right to inform the Contractor of any schedule conflicts. All conflicts must be resolved prior to the scheduled event by the Contractor. Whenever non-critical services have been scheduled on the date a holiday occurs, such services shall be performed on the following working day. The intent of the Government is to allow the Contractor to develop an optimal formal schedule and plan rather than to impose a rigid fixed schedule and plan which in some cases may not be appropriate or cost effective. In developing PM schedules and plan guides, the Contractor should consider and rely on: (1) past Government records; (2) the Contractor's own experience; (3) industry standards and guides; and 4) PT&I findings and recommendations, and then develop a program which produces the most appropriate and effective preservation of the equipment and operational efficiency of the building or utility systems. The PM Checklist sheets shown in Attachment 2.05.07, Section J, represent the Government's current position on PM maintenance methods and frequencies, and if no changes are proposed, shall be used as the base PM maintenance program. The Contractor is invited to propose changes as substitutions to the current position or modifications if it improves maintenance functionality and value, and does not violate any statutes, regulations, or directives.

C1.3.D.2 Initial Work Schedule.

BASE PERIOD: Within 15 calendar days prior to the start of the Base Period and 15 calendar days prior to the start of the Option Period thereafter, the Contractor shall submit to the Contracting Officer and COTR a general work schedule of planned work to be performed for the three-year Base Period or the Option Period. The initial work schedule should be submitted as one (1) legible hard copy and one (1) electronic copy in a format acceptable to the COTR. Recurring services shall be identified at a minimum by building or area location, equipment number, and PM number as applicable with the scheduled completion date of performance indicated. This schedule shall be divided into categories such that all work specified in the technical sections of the proposal is separately covered. The schedule shall indicate, by month, all services to be accomplished, the frequency of the services, and the location. Any reduction of services, specifically the PM schedules and frequencies that represent the current status shown in Attachment 2.05.07, Section J, shall be approved by the COTR prior to the start of the Base Period or the Option Period.

The above work schedules shall serve as the baseline work schedule for each of the Base and Option Period. Any changes to these schedules shall be discussed with and approved by the COTR. If such changes affect the terms and conditions and price, then Contracting Officer approval is required.

C1.3.D.3 Monthly Work Schedule (MWS). The Contractor shall develop a MWS for all work specified in this contract for each of the Base and Option Period. The Contractor shall submit one (1) electronic copy of this schedule to the COTR for approval no later than the 15th of the previous month for which the work is scheduled. For example, the MWS for work to be performed 01 December through 31 December shall be submitted to the

COTR no later than 15 November. The schedule shall identify the completion date of all work, including work ordered under the IDIQ section of the contract. The schedule shall identify work by CTO number (job order number) and title, and indicate the scheduled start and completion dates. Recurring services shall be properly identified indicating frequency, number of days per month, specific day(s), and timeframe each service will be performed. Changes or additions to any job that prevent the Contractor from completing the work on time, or which changes shall be reported to the COTR in writing. Deviation from the MWS is permissible only when due to inclement weather, natural disaster, emergencies beyond the Contractor's control, the convenience of the Government, scheduled conflicts the Contractor becomes aware of through the course of work performed, or by any notification from the COTR. Deviations not requested by the Government, or those that have not been reported to the COTR, shall be reported in writing within 24 hours of the deviation.

C1.3.E Operation Procedures Plan. The Contractor shall prepare an Operation Procedures Plan annually for all contract services for each contract period. The initial plan outlines historical information (usually from the CMMS) to provide an accounting of work performed and identify emerging trends. The plan also contains the maintenance approach and documents progress in implementing RCM. The Operation Procedures Plan will be used by NASA to budget for maintenance, develop the five (5) year maintenance plan, plan other work, and provide an opportunity for the Contractor to identify trends and to propose changes to the maintenance approach. A complete plan encompasses all systems and equipment and addresses all items identified in this contract, provides a schedule for reviewing all systems, provides technical rationale for all recommendations, and identifies risk associated with proposed changes (probability of failure and effect on NASA mission or safety). The Contractor shall use PT&I results to help forecast maintenance schedules and assist in reducing overall maintenance costs to the Government. When proposing changes to the maintenance approach, the Contractor shall use RCM strategy as defined in Section C2, Definitions, and in NPR 8831.2E or NASA Reliability Centered Maintenance Guide For Facilities and Collateral Equipment. The Government will consider all proposed changes, even those that reduce the recurring workload, if the result is increased facility availability and reliability. (See Section H, Order Limitation Special Provision, for possible adjustments to the contract price for reductions of the workload).

C1.3.E.1 Initial Plan. The Contractor shall assemble and review historical information (usually from the CMMS) in order to provide an accounting of work performed and to identify emerging trends. Specifically, this plan will provide an accounting of work performed by NASA work element and facility, area, structure, or other category. Also, additions and deletions to the inventory of buildings and structures to be maintained will be identified. Data will be provided for the first 9 months of the contract year in order to identify trends. The initial report will be prepared in the Contractor's format and will be delivered to the COTR 30 days after the end of the first 9 months of the first contract year.

C1.3.E.2 Follow-On Plans. All plans after the initial plan will review the maintenance approach and document progress in implementing RCM. Contract Requirement No. C13-502, Facility Condition Assessment, will assist in the RCM process. The Contractor will identify inherent reliability problems, ineffective maintenance and proposed changes, and emerging maintenance issues and proposed approaches. Proposed approaches will include schedules that account for facility user requirements. The RCM strategy provides an approach for determining the most effective maintenance mix and includes run to failure, condition based maintenance, and interval based (time, cycles, operating hours) maintenance. There are several references available for Contractor use in understanding RCM principles, including NPR 8831.2E. Years of RCM analysis have been performed and the Contractor should build upon and expand upon that work. This RCM analysis will be available in the TRL. The Contractor will identify which facilities have been reviewed and provide a schedule for performing a biennial review of all

systems. Proposed changes could include substitution of PT&I for time based preventive maintenance. Material condition analysis and RCM analysis reports must be provided to support recommendations. These reports will be prepared in the Contractor's format and shall be delivered to the COTR annually.

C1.3.F Records and Reports.

Records. The Contractor shall maintain historical records of all work performed, and prepare and submit all reports and operating procedures specified herein. Daily, weekly, monthly, other recurring operating records, reports, logs, and other documents are specified as contract requirement submissions in the technical sections of this SOW under documentation and reporting requirements or Section F.3, Delivery of Reports; summarized in the PRS Table, Attachment 3, Section J; or specified within this document as inherent performance requirements under the FFP portion of the contract.

C1.3.F.1 Computerized Maintenance Management System (CMMS). The Contractor shall maintain and manage a CMMS to reflect all work performed (TC, PM, CTOs, readings, equipment findings, test results, engineering studies, and all work performed by other contractors or the Government related to facilities maintenance). The Contractor shall use the existing system, replace it with an equivalent CMMS that performs all existing functions, or provide equivalent population and retrieval of data and fields. The CMMS database may contain sensitive but unclassified information.

C1.3.F.1.a Existing CMMS: The Contractor shall maintain and manage the CMMS to reflect all work performed including work performed by other contractors or the Government related to facilities maintenance. The database entry software currently used is the MAXIMO® Maintenance System by International Business Machines (IBM) Corporation (acquired from MRO Software, Inc., of Bedford, Massachusetts.) bundled with a relational database licensed with Oracle Corporation. The Contractor shall implement and use the Equipment, Work Orders, Inventory, PMs, Job Plans, Labor, and Resources modules of the MAXIMO® Maintenance System. All the other modules available in MAXIMO®, including the Purchasing, Calendars, Notes, Setup, and Utilities modules, are available for the Contractor's use at their discretion. The current contents of the required modules are detailed in Attachment 2.05.08, Section J. The Government will furnish database software, existing licenses, file servers, and the on-site network infrastructure. The Contractor shall provide and maintain compatible workstations for their own use. Compatible workstations require a Pentium dual-core or higher processor, Microsoft Windows® operating system, Ethernet network interface, one gigabyte or more of random access memory (RAM), and must be able to run the MAXIMO® software. The Contractor shall provide maintenance and support for all Government furnished software and hardware unless otherwise specified. In addition, the Contractor shall maintain the CMMS and associated database software on all Government computers licensed to access MAXIMO®. The Government will provide all maintenance and administration of the on-site network infrastructure. The Contractor may modify the configuration of the database provided that the COTR gives written permission. No data, except data entered in error by the Contractor, shall be deleted or archived from the database without the written consent of the COTR. The database shall be backed up on a daily basis on an independent system to prevent loss of data. The Government may at any time access the database and review the information contained therein. The database, including changes made under this contract, is Government property, for the exclusive use of the Government, and may not be transferred to another location, in any form, or used by the Contractor for any purpose except for work performed under this contract.

(See Paragraph C1.4.G.2, General Administrative Requirements; Security Requirements; Disclosure of Information.)

- C1.3.F.1.b New CMMS (Optional): Subject to prior approval from the Contracting Officer and COTR, the Contractor may replace the existing CMMS with a current technology application that is generally available to the public and in current use. The software shall support user-selectable measurement units for display and printout. The user shall be able to select between SI units and inch-pound units. In addition, the application shall perform all existing functional capabilities in use by the current CMMS system. Historical data from 01 October 2004, shall be migrated to the new system. The Contractor must provide compatibility and on-line connectivity to Government workstations through the existing network infrastructure. The Contractor must demonstrate the new system to the Government prior to complete replacement of the existing system for assurance of historical data retention and correctness, functional capabilities, robustness, and long-term maintainability. The Contractor may run the new system in parallel with the existing system as long as necessary until the new system is fully operational, but not more than 180 calendar days after the start of the Base Period. The CMMS database, including changes made under this contract, shall become Government property, and may not be transferred to another location, in any form, or used by the Contractor for any other purpose except for work performed under this contract.
- C1.3.F.1.c CMMS Generated Records and Reports. The Contractor shall maintain management, operation, and maintenance records and prepare management, operation, and maintenance reports. Where possible, the Contractor is encouraged to provide information by electronic means and not duplicate information already in the CMMS.
- C1.3.F.2 Contract Task Order (CTO) Status Report. A weekly status report shall be generated for all CTOs in progress and submitted to the COTR. Refer to Section F.3, Delivery of Reports.
- C1.3.F.3 Performance Metrics Report. A quarterly report shall be generated to the COTR that includes performance metrics of work planned and completed. Metrics shall include all items shown in Attachment 2.05.10, Section J. Refer to Attachment 5, Contract Data Requirements List.
- C1.3.F.4 Contract Hours Per Building Report. The Contractor shall submit an annual report electronically to the COTR summarizing the performance of all FFP work, IDIQ work, and CPFF work classified on a per building basis. The report shall contain actual hours expended by the Contractor in each building or infrastructure category for all work contained in this work statement. In addition, all IDIQ work shall be reported to the Government by the Contract Line Item Numbers (CLINs) shown on the pricing schedules.
- C1.3.F.5 Hardcopy and Electronic Format. All correspondence, records, reports, logs, and other documents submitted by the Contractor to the Government shall be provided in electronic form where feasible and software compatible, unless otherwise specified. Acceptable and readable formats are Microsoft Word®, Microsoft Excel®, Adobe PDF®, or other formats acceptable to the Contracting Officer and COTR. Delivery shall be made via an electronic mail attachment, CD-R, CD-RW, Zip format, or other communication methods required by the Government, except as otherwise specified in Section F.3, Delivery of Reports.

C1.3.F.6 Contract Completion. All records and copies of reports shall be turned over to the COTR within 30 calendar days following completion or termination of the contract, or as directed by the Contracting Officer.

C1.3.F.7 Media. All information and the media (if applicable) on which it is delivered to the Government become the property of the Government and will not be returned to the Contractor except to correct errors.

C1.4 GENERAL ADMINISTRATIVE REQUIREMENTS

C1.4.A Directives, Instructions, Policies, and Regulations.

C1.4.A.1 Regulatory Requirements. The Contractor and their employees shall become acquainted with and obey all Government directives, procedures and guidelines, instructions, policies, and regulations, or abide by requirements as requested by the COTR. See Attachment 2.06.01, Section J, for a listing of applicable NASA and other Federal agencies directives, instructions, policies, and regulations. The Contractor shall use most current standards to all referenced codes and guidelines when applicable.

C1.4.A.2 Water Conservation. The Contractor shall actively conserve water at all times during the performance of work related to this contract. The Contractor can use reclaimed water when available. The Contractor will not delay work performance or hold the Government responsible for delays if on-site reclaimed water source is unavailable.

C1.4.B Emergency Procedures. The Contractor shall ensure that employees know how to report any accident, injury, fire, toxic chemical, electrical, security, flooding, or police emergency in accordance with published on-site procedures.

C1.4.C Environmental Protection and Policies. The Contractor shall comply with all applicable Federal, State, and local laws, and with the regulations and standards listed in Attachment 2.06.01, Section J. All environmental protection matters shall be coordinated with the COTR. Inspection of any of the facilities operated by the Contractor may be accomplished by the Government or authorized officials without notice at any time. In the event that a regulatory agency assesses a monetary fine against the Government for violations caused by the Contractor, the Contractor shall reimburse the Government for the amount of that fine and other related costs incurred by the Government. The Contractor shall also ensure there are trained personnel to clean up any hazardous waste spills resulting from the Contractor's operations. The Contractor shall comply with the instructions of the cognizant NASA Occupational Safety, Health and Medical Services Division (Code QH) with respect to avoidance of conditions which create a nuisance or which may be hazardous to the safety and health of on-site personnel. The Contractor shall observe and adhere to all requirements for handling and storage of combustible supplies, materials, waste, and trash.

C1.4.D Documentation Reduction. The Contractor shall ensure, to the maximum extent possible, that documents be transferred electronically, documents printed internally be double-sided on recycled paper, and contracts, grants, and cooperative agreements (as applicable) include provisions that require documents to be printed double-sided on recycled paper meeting or exceeding the standards established in Executive Order (EO) 12873 of October 20, 1993, or in future EPA guidelines.

C1.4.E Disposal. Debris, rubbish, and non-usable material resulting from the work under this contract shall be disposed of by the Contractor in refuse bins located throughout the site or off Government property at their expense when directed by the COTR. Hazardous waste must not be removed from Government property, but shall be turned over to the Government for disposal as detailed in Section C20, Environmental and Emergency Support Services.

C1.4.F Safety Requirements and Reports.

C1.4.F.1 Safety. All work shall be conducted in a safe manner and shall comply with all Federal OSHA and local regulations unless otherwise directed by NASA. The Contractor shall demonstrate proactive and innovative safety practices on a continual basis throughout the contract period. In addition, the Contractor shall provide all safety equipment required to perform the work specified in this contract.

C1.4.F.2 Conference. During the Phase-In period, the Contractor shall meet in conference with the Contracting Officer and COTR to discuss and develop mutual understandings relative to administration of the Environmental Safety and Health (ESH) Program. This conference should last approximately two (2) hours. The Contractor should contact the COTR to set up the conference.

C1.4.F.3 Inspections. The Contractor's workspace may be inspected periodically for violations of Federal, State, and local regulations. Correction of violations will be the responsibility of the Contractor as determined by the Government. The Contractor shall provide assistance to safety, environmental, and maintenance representative(s) and the Federal OSHA or local inspector if a complaint is filed. Any fines levied on the Contractor by Federal OSHA or Cal-OSHA offices due to safety and health violations shall be paid to NASA within 30 days of notification by the applicable Government agency. The Contractor may negotiate in good faith with the applicable Government agency for a lesser fine. NASA will reimburse reductions in monetary fines to the Contractor during the next payment cycle.

C1.4.F.4 Accidents. The Contractor shall report to the COTR, exposure to any substance, possible exposure to any substance, and all accidents resulting in death, trauma, occupational disease, serious bodily injury, or environmental damage. All accidents shall be reported to the COTR as soon as practicable, but no later than two (2) hours after their occurrence during regular working hours, or no later than 24 hours after their occurrence after regular working hours or start of next working day, whichever is earlier. The Contractor must complete a NASA mishap report using the Incident Reporting Information System (IRIS EX3 System) and NASA Contractor Monthly Accident Report (CMAR) per Section F.3, Delivery of Reports.

C1.4.F.5 Damage. In the event of damage to Government property, equipment, or the on-site environment by Contractor employees, the Contractor shall submit to the COTR a full report of the damage. All damage reports shall be submitted to the COTR within 24 hours of the occurrence. The Contracting Officer will take action if necessary.

C1.4.G Security Requirements.

C1.4.G.1 Security. The Contractor shall comply with all NASA and local security requirements. Upon request, the Contractor shall submit the name and address of each employee hired for work on this contract and shall ensure all questionnaires and other forms that may be required are completed in a timely manner.

C1.4.G.2 Disclosure of Information. Neither the Contractor nor any of its employees shall disclose, or cause to be disseminated, any information concerning Government operations, including those performed by contractors to the Government, which could result in or increase the likelihood of the possibility of a breach of security or interrupt the continuity of operations. Disclosure of information relating to the services hereunder to any person not entitled to receive it, or failure to safeguard any classified information that may come to the Contractor or any person under their control in connection with work under this contract, may subject the Contractor, their agents, or employees to criminal liability under 18 U.S.C. Sections 793 and 798. All inquiries, comments, or complaints arising from any matter observed, experienced, or learned as

a result of, or in connection with, the performance of this contract, the resolution of which may require the dissemination of official information, will be directed to the COTR.

- C1.4.G.3 Violations. Deviations from, or violations of, any of the provisions of Paragraph C1.4.G, Security Requirements, may, in addition to all other criminal and civil remedies provided by law, subject the Contractor to immediate termination for default.
- C1.4.H Passes and Badges. All Contractor employees shall obtain the required employee passes or badges. See Section I.2, FAR 52.204-9, Personal Identity Verification of Contractor Personnel, for employee badging procedures. During the Phase-In period, the Contractor shall submit to the Contracting Officer an estimate of the number of personnel expected to be utilized at any one time on the contract. The Government will issue badges without charge. Each employee shall wear the Government issued badge over the front of their outer clothing and above the waist at all times on Government property, except when this presents a safety hazard, in which case, the badge must be kept in the employee's possession. When an employee leaves the Contractor's service, the employee's pass or badge shall be returned before final termination of employment. Passes and badges issued to Contractor employees shall not negate the requirement for employee identification required in Paragraph C1.4.K, Identification of Contractor Employees.
- C1.4.J Access to Buildings and Facilities.
- C1.4.J.1 Access. It shall be the Contractor's responsibility to obtain authorized access to buildings and facilities, and arrange for them to be opened and closed to accomplish work under this contract. See Paragraph C1.2.L, Customer Notification, Security Escorts, and Facility Access.
- C1.4.J.2 Keys and Cardkeys. Keys and Cardkeys may be issued to the Contractor; however, it shall be the Contractor's responsibility to arrange for adequate security of the buildings and facilities being worked on at the end of each working day. The Contractor shall be responsible for the cost of replacing keys, cardkeys, and/or locks that are furnished to and lost by their employees. In addition, the Contractor shall pay the cost of changing a combination lock if the COTR has reasonable cause to believe that the combination has been compromised. Similarly, if an entire key sequence is jeopardized causing the Government to re-key an entire group, department, or facility, the full cost shall be borne by the Contractor administered by the COTR through the deduction methodology.
- C1.4.K Identification of Contractor Employees.
- C1.4.K.1 Listing of Names. The Contractor shall provide to the Contracting Officer the name(s) of the supervisory personnel authorized to act for the Contractor. The Contractor shall furnish sufficient personnel to perform all work specified within the contract. The Contractor shall provide an alphabetized employee roster divided by shift, i.e. 1st, 2nd, and 3rd shifts to the Contracting Officer and COTR. The employee roster shall include employee name, position, duty station(s), telephone and radio number, and scheduled work periods for periodic floor-checks and inspections by the Government.
- C1.4.K.2 Conduct. Contractor employees shall conduct themselves in a proper, efficient, courteous, and business-like manner. The Contractor shall remove from the site any individual whose continued employment is deemed by the Contracting Officer or NASA Security to be contrary to the public interest or inconsistent with the best interests of Government security.
- C1.4.K.3 Residency. No employee or representative of the Contractor will be admitted to the work site unless they furnish satisfactory proof of their citizenship of the United States, or, if an alien, proof of residency within the United States.

- C1.4.K.4 Employee Identification. All Contractor/subcontractor employees working under this contract shall be identified by a distinctive nameplate, emblem, or patch attached in a prominent place on an outer garment. Employee identification shall not be substituted for NASA required passes or badges. (See Paragraph C1.4.H, Passes and Badges).
- C1.4.L Identification of Vehicles.
- C1.4.L.1 Contractor Vehicles. The company name shall be displayed on each of the Contractor's vehicles only in a manner and size that is clearly visible. All Contractor vehicles shall display a valid State license plate, shall be maintained in good repair, and adhere to all State and local codes.
- C1.4.L.2 Employee Personal Vehicles. All Contractor employee personal vehicles shall comply with all California Department of Motor Vehicles (DMV) and NASA security requirements.
- C1.4.M Permits. The Contractor shall, without additional expense to the Government, obtain all appointments, licenses, and permits required for the prosecution of the work. The Contractor shall comply with all applicable Federal, State, and local laws. Evidence of such permits and licenses shall be provided to the COTR for approval 7 calendar days prior to the end of the Phase-In Period and within one (1) day upon any personnel change thereafter. All licenses and certificates shall be current, and shall be kept current throughout the contract period.

END OF SECTION C1

SECTION C2**DEFINITIONS**

As used throughout this contract, the following terms shall have the meaning set forth below.

Where "as shown", "as indicated", "as detailed", or words of similar import are used, it shall be understood that reference is made to this specification and the drawings accompanying this specification unless stated otherwise.

Where "as directed", "as required", "as permitted", "approval", "acceptance", or words of similar import are used, it shall be understood that direction, requirement, permission, approval, or acceptance of the Contracting Officer is intended, unless stated otherwise.

Alteration: The work required to adjust arrangements, to make changes, or to modify other physical characteristics of an existing real property facility so that it may be more effectively adapted to or utilized for its designated purpose.

Backlogged Trouble Calls: A trouble call which was not completed for any reason, or maintenance, repair, and minor corrective maintenance requirements which may be identified during lapses, if any, in services during the transition from the old contract to the new contract.

Backlog of Maintenance and Repair (BMAR): The non-funded facilities maintenance work required to bring facilities and collateral equipment to a condition that meets acceptable maintenance standards. BMAR is based on data from the Plant Engineering Facilities Condition Assessment and maintenance projects reported by the research and development organizations. It compares current conditions to acceptable maintenance standards and estimates the cost to return the systems and equipment to the standard condition. This cost is compared to the current year maintenance and repair budget. All work in excess of the budget is added to the BMAR.

Bin Stock: Material parts like fasteners, screws, bolts, nuts, washers, pipe fittings, tape, glue, etc. that are usually of low value and have a high usage rate in the performance of maintenance type work.

Building: The classification "Building" includes the basic structure, capital improvements, and fixed equipment that are normally required for the functional use of the building and becomes permanently attached to and made a part of the building and that cannot be removed without cutting into the walls, ceilings, or floors, such as plumbing, heating, and lighting equipment; elevators; central air-conditioning systems; and built-in safes and vaults.

Collateral Equipment: Encompasses building-type equipment, built-in equipment, and large, substantially affixed equipment/property and is normally acquired and installed as part of a facility project as described below:

1. Building-Type Equipment. A term used in connection with facility projects to describe equipment that is normally required to make a facility useful and operable. It is built in or affixed to the facility in such a manner that removal would impair the usefulness, safety, or environment of the facility. Such equipment includes elevators; heating, ventilating, air-conditioning, and refrigeration systems; transformers; compressors; and other like items generally accepted as being an inherent part of a building or structure and essential to its utility. Such equipment also includes general building systems and subsystems such as electrical, plumbing, pneumatic, fire protection, and control and monitoring systems.
2. Built-in or Large, Substantially Affixed Equipment. A term used in connection with facility projects of any type other than building-type equipment that is to be built in, affixed to, or installed in real property in such manner that the installation cost, including special

foundations or unique utilities service, or the facility restoration work required after its removal is substantial.

Contract Task Order (CTO): A form method used by the Government under this contract to order Indefinite Delivery Indefinite Quantity work from the Contractor.

Contract Task Order Request (CTOR): A form method used by the Contractor under this contract to request Indefinite Delivery Indefinite Quantity work from the Government. CTORs are developed when the Contractor identifies problems and deficiencies noted during the course of performing work on-site. However, resulting work to the Contractor is not guaranteed.

Contracting Officer (CO): The Contracting Officer is a person with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the Contracting Officer acting within the limits of their authority as delegated by the Contracting Officer.

Contracting Officer's Technical Representative (COTR): The person who is an authorized Government representative of the Contracting Officer acting within the limits of his/her authority as specified by the COTR delegation letter. This term does not include any inspector or other person not named as COTR or Alternate COTR in the delegation letter. A copy of the COTR delegation letter will be provided to the Contractor.

Contractor: The term Contractor as used herein refers to both the prime Contractor and any subcontractors. The prime Contractor has a contract with the Government directly. The prime Contractor shall ensure that subcontractors comply with the provisions of this contract.

Contractor Representative: An assigned foreman, superintendent, or manager who is empowered to make day-to-day decisions related to all performance under this contract. The Contractor Representative shall serve as the focal point for all work under this contract and shall be responsible for the coordination of all work activities.

Craft Hour Unit Price (CHUP): A CHUP is the price proposed by the Contractor that shall include all direct costs (except for construction materials and construction equipment) and indirect costs plus profit to provide one (1) craft hour of work-in-place. The CHUP includes the Contractor's burdened hourly craft wage, adjusted to allow for its workforce productivity (*i.e.*, an estimate of how the workforce will perform in relation to normal industry performance standards), and all mark-up costs including, but not limited to, craft delay allowances (union agreements, partial day influences, crew sizes, security passes and escort, and other unavoidable delays and downtime), craft travel, mobilization at site, site movement, breaks, cleanup, safety standby, and gas free certification for confined space entry (when applicable), minor materials and supplies incidental to the job (*i.e.* solder, lead, flux, electrical connectors, electrical tape, fuses, nails, screws, bolts, nuts, washers, spacers, masking tape, sand paper, solvent, cleaners, lubricants, grease, oil, rags, mops, glue, epoxy, spackling compound, joint tape, plumbers tape and compound, clips, welding rods, heat sinks, touch up paint, plumbing fittings, etc.), ordering and stockpiling job material (including usual shipping, handling, and restocking fees), normal and additional material handling (including scaffolding erection and dismantling), hand tools, portable equipment, job (field) overhead (including clerical support, supervision, inspection, fees, taxes, licenses, permits, and insurance), general and administrative (home office) overhead, and profit. (Same as Work Hour or Labor Hour)

Davis-Bacon Act (DBA) Work: The Davis-Bacon Act provides that contracts, in excess of \$2,000 to which the United States or the District of Columbia is a party for construction, alteration, or repair (including painting and decorating) of public buildings or public works within the United States, shall contain a clause (FAR 52.222-6) that no laborer or mechanic employed directly upon the site of the work shall receive less than the prevailing wage rates as determined by the Secretary of Labor.

Debris: Undesirable or discarded material including, but not limited to, cut or trimmed vegetation, paper, cans and bottles, otherwise referred to as "trash" and "litter", fallen tree limbs and branches, rocks, street

sweepings, maintenance, repair, and construction (including roofing) waste, and similar waste material, but not including hazardous waste.

Defect: A defect is composed of one (1) or more documented deficiencies of unsatisfactory work performance caused by either poor performance or non-performance.

Emergency Response: A response effort that requires immediate action by employees or other designated personnel to an occurrence which results, or is likely to result, in an event that causes imminent danger to life, damage to Government property, or damage to the environment.

Emergency Operations Center (EOC): An office that directs, coordinates, and controls all tactical activities and management functions necessary to carry out the objectives of Command and Emergency Response.

Facility: A term used to encompass land, buildings, other structures, and other real property improvements, including utility systems, collateral equipment, or assembly of units of equipment designated for a specific function. The term does not include operating materials, supplies, special tooling, special test equipment, or non-capitalized equipment. (See NASA Financial Management Manual (FMM 9250) for criteria for capitalized equipment). The term "facility" is used in connection with land, buildings (facilities having the basic function to enclose usable space), structures (facilities having the basic function of a research or operational activity), and other real property improvements.

Facility Services Manager (FSM): A person assigned by the Government who serves as a point of contact, for the Center, related to problems and issues in a designated area or building for which they serve as a representative responsible for relaying information and coordinating activities. A list of Facility Services Managers will be available from the Facilities Planning Branch (Code JFF) at the Center via the internet web site.

Failure Modes and Effects Analysis (FMEA): A process that is very adept at determining all the ways that equipment and systems could fail. An FMEA consists of four items of information; functional failure, dominant failure mode, failure cause and effect, and recommended action.

Frequency of Service:

1. Triennial (T): Services performed once every three years on a date or during the month specified.
2. Biennial (B): Services performed once every two years on a date or during the month specified.
3. Annual (A): Services performed once during each 12 month period of the contract at intervals of 335 to 395 calendar days.
4. Semi-annual (SA): Services performed twice during each 12 month period of the contract at intervals of 160 to 200 calendar days.
5. Quarterly (Q): Services performed four times during each 12 month period of the contract at intervals of 80 to 100 calendar days.
6. Bi-monthly (BM): Services performed six times during each 12 month period of the contract at intervals of 58 to 63 calendar days.
7. Monthly (M): Services performed 12 times during each 12 month period of the contract at intervals of 28 to 32 calendar days.
8. Bi-weekly (BW): Services performed 26 times during each 12 month period of the contract at intervals of 13 to 15 calendar days.
9. Weekly (W): Services performed 52 times during each 12 month period of the contract at intervals of six to eight calendar days.
10. Semi-weekly (SW): Services performed 104 times during each 12 month period of the contract at intervals of two to three calendar days.

11. Daily: (D5) Services performed 261 times during each 12 month period of the contract, once each day, Monday through Friday, including holidays unless otherwise noted; or (D7) services performed every day, seven days a week during each 12 month period of the contract including holidays unless otherwise noted.

Full-Time Equivalent (FTE): In the U.S. Federal Government, FTE is defined by the Government Accountability Office (GAO) as the number of total hours worked divided by the maximum number of compensable hours in a work year as defined by law. For example, if the work year is defined as 2,080 hours, then one worker occupying a paid full time job all year would consume one FTE. Two employees working for 1,040 hours each would consume one FTE between the two of them.

Government Property: All property owned by, or leased to, the Government or acquired by the Government.

Grounds: All areas not occupied by buildings, structures, or pavements.

Hazardous Waste: Waste materials that are toxic or poisonous, oxidizers, corrosive, irritating or sensitizing, radioactive, biologically infectious, explosive, flammable, or that present a significant hazard to human health and the environment as determined by Federal, State or Local regulatory authorities, or that are listed in Federal or State regulations. Special handling procedures and facilities are required in their disposal.

High Voltage: Any electrical voltage exceeding 600V per the National Electric Code (NEC).

Journeyman: An experienced person who has served a required apprenticeship or equivalent training period (four years or more) in a designated field, craft, or trade that can be documented by a certificate or diploma from a recognized organization, school, or trade school program.

Latent Defects: Defects that are present in a hidden or undeveloped state and are not visible or apparent at the time of inspection, but which become obvious or come into being at some future time.

Low Voltage: Any voltage below 600V per the National Electric Code (NEC).

Maintenance: The recurring day-to-day, periodic, or scheduled work required to preserve or restore a real property facility or collateral equipment to such a condition that it may be effectively utilized for its designated purpose over an intended service life. The term includes work undertaken to prevent damage to a facility or piece of equipment that otherwise would be more costly to restore. Maintenance minimizes or corrects wear and tear and thereby forestalls major repairs.

Material: An item that is utilized to produce an end product, or incorporated into, or attached to an end item.

Miller Act: The Miller Act (40 U.S.C. Section 3131 to 3134) provides that, before a contract that exceeds \$100,000 in amount for the construction, alteration, or repair of any building or public work of the United States is awarded to any person, that person shall furnish the federal government with the following: 1) A performance bond in an amount that the Contracting Officer regards as adequate for the protection of the federal government; 2) A separate payment bond for the protection of suppliers of labor and materials. The amount of the payment bond shall be equal to the total amount payable by the terms of the contract unless the Contracting Officer awarding the contract makes a written determination supported by specific findings that a payment bond in that amount is impractical, in which case the amount of the payment bond shall be set by the Contracting Officer. The amount of the payment bond shall not be less than the amount of the performance bond.

NASA Ames Dispatch Office: An office housing monitoring equipment for fire, security, and facility alarms that is operated 24 hours per day, 365 days per year, by the Protective Services Office (Code JP) at Ames Research Center.

Noncollateral Equipment. Includes all equipment other than collateral equipment. Such equipment, when acquired and used in a facility or a test apparatus, can be severed and removed after erection or installation without substantial loss of value or damage thereto or to the premise(s) where installed. Noncollateral equipment imparts to the facility or test apparatus its particular character at the time (e.g., furniture in an office building, laboratory equipment in a laboratory, test equipment in a test stand, machine tools in a shop facility, computers in a computer facility) and is not required to make the facility useful or operable as a structure or building.

Operations and Maintenance of Facilities Innovations Team (OMFIT). The NASA Operations and Maintenance of Facilities Innovations Team supports NASA's facilities operations and maintenance to identify and advance the processes/technologies of maintainability. It is an Agency-wide organization. The objectives of the Team are to improve the operations and maintenance of existing facilities over their entire life cycles and to promote the sustainability concept of maintainability for new construction, renovations, rehabs and repairs.

Performance Requirements Summary (PRS): A summary of contract requirements for each statement of work section with weighted evaluation criteria indicators and standards of performance which are used by the Government to assess monthly Contractor performance and is the primary basis for deducting for partially performed, unsatisfactorily performed, or non-performed work. The PRS is provided as Attachment 3, Section J.

Pleasing Appearance: An appearance similar to the original finished appearance with only minor, unobjectionable deterioration resulting from normal use.

Predictive Maintenance (PdM): A subset of the RCM program that utilizes non-intrusive methods to determine best maintenance practices incorporating PT&I and FMEA. Elements of a PdM program are scheduling, monitoring/processing, diagnosis, prognosis, communication, root cause analysis, and economic evaluation.

Predictive Testing and Inspection (PT&I): The use of primarily non-intrusive technology to assess machinery condition or identify maintenance problems. It replaces arbitrarily timed maintenance with maintenance that is scheduled only when the condition of the equipment or predicament requires it. The continuing analysis of PT&I data obtained allows for planning and scheduling corrective maintenance or repairs in advance of catastrophic or functional failure. Common PT&I technologies include vibration analysis, infrared thermography, precision balancing and alignment, and tribology. Refer to APD 8830.1, Reliability Centered Maintenance Program for Institutional Equipment, for more detailed explanation.

Preventive Maintenance (PM): The planned, scheduled periodic inspection, adjustment, cleaning, lubrication, parts replacement, and routine repair of equipment and systems for which a specific operator is not assigned. PM consists of many checkpoint activities on items that, if disabled, would interfere with an essential operation, endanger life or property, or involve high cost or long lead time for replacement.

Proactive Maintenance: Also referred to as "root-cause failure analysis," proactive maintenance is the further application of predictive maintenance technologies toward extending machinery life. It seeks to reduce the need for maintenance through better design, better installation, and related PT&I technologies.

Quality Assurance (QA): A method used by the Government to provide some measure of evaluation over the quality of purchased goods and services received.

Quality Assurance Evaluator (QAE): A person or persons designated by the CO/COTR to measure/monitor Contractor performance under this contract.

Quality Assurance Program: A program implemented by the Government to evaluate the output quality and responsiveness of the Contractor to ensure that the Government receives the services for which public funds are expended. It is emphasized that the Government's quality assurance program is not a substitute for the quality control program implemented and administered by the Contractor.

Quality Control (QC): A method used by the Contractor to control the quality of goods and services produced.

Quality Control Plan (QCP): A plan implemented by the Contractor to help identify, correct, and control problems throughout the entire scope of the Contractor's own operations.

Reactive Maintenance: Often called breakdown maintenance or "run to failure (RTF)." Reactive maintenance or equipment repairs are performed only when the deterioration in a machine's condition causes a functional failure. A high percentage of unplanned maintenance and repair work, high replacement part inventories, and the inefficient use of maintenance personnel typify this strategy.

Real Property: All Government lands and rights therein; ground improvements, utility distribution systems, buildings, structures, and collateral equipment.

Rebuilt Components/Assemblies: Components, assemblies, or subassemblies of equipment that have been disassembled and reconstructed using replacement or re-manufactured parts as necessary and reassembled to produce a serviceable product whose service life expectancy is at least equal to the original component/assembly.

Reliability Centered Maintenance (RCM): RCM is a maintenance strategy that methodically develops the optimum mix of preventive, predictive, reactive, and proactive maintenance practices. These maintenance practices, rather than being applied independently, are integrated to take advantage of their respective strengths in order to maximize system availability and efficiency while minimizing life cycle costs. RCM seeks to preserve system function. This is accomplished by methodically identifying failure modes that degrade or eliminate system function, and determining maintenance processes to identify onset of failure and restoration of desired functions.

Repair: Repair is the restoration of a piece of equipment, a system, or a real property facility to such a condition substantially equivalent to its originally intended and designed capacity, efficiency, or capability that it may be effectively utilized for its designated purposes. Repair may be overhaul, reprocessing, or replacement of constituent parts or materials that have deteriorated by action of the elements or usage and have not been corrected through maintenance, or replacement of the entire unit or system if beyond economical repair.

Response Time: Response time is defined as the time allowed the Contractor after initial notification of a work requirement to be physically on the premises at the work site with appropriate tools, equipment, and materials, ready to perform the work required.

Run to Failure (RTF): The determination that after application of FMEA, and review of life cycle cost factors, including impact to NASA mission objectives, that the loss of the function is acceptable and will be apparent (no hidden failures). RCM acknowledges time-based PM, condition-based PM, and RTF.

Service Contract Act (SCA) Work: The Service Contract Act (41 U.S.C. 351, as amended provides that contracts in excess of \$2,500.00 to which the United States or the District of Columbia is a party hereto, for the furnishing of services through the use of service employees, shall contain a clause (FAR 52.222-41) that no service employee shall receive less than the minimum prevailing wage rates and fringe benefits as determined by the Secretary of Labor.

Service Request: A request for services by a customer, tenant, or resident agency on Moffett Field directed to the Plant Engineering Branch at Ames Research Center on ARC Form 73. Service request work is typically work performed by maintenance organizations that is classified either as maintenance and/or construction type work, and this work can be directed to the Facilities Maintenance Services contractor under a contract task order for completion.

SI: The International System of Units; SI is the modernized version of the metric system based on the meter, kilogram, and second (MKS) units. It is a decimal system composed of basic, supplementary, and derived units, and is the system that is preferred for all applications for the Government.

Surfaced Areas: Surfaced areas include all concrete, asphalt, and gravel surfaces and their associated features such as curbs, gutters, inlets, drains, and manhole surfaces. Surfaced areas include, but are not limited to, vehicular pavements, sidewalks, patios, pathways, recreational courts, exterior stairways, ramps, pads, and all shoulders of above.

Trouble Calls (TC): Trouble calls are reactive maintenance work that is generally called in by Facility Service Managers, maintenance workers, or occupants of a facility. This category is composed of three (3) types of work defined in Section C5.2.C, Firm Fixed Price Work; Trouble Calls; Classification of Trouble Calls. The scope of a trouble call is limited to \$2500.00 in total labor and material cost as determined using R.S. Means® Cost Data as the basis.

Utility Distribution System: A system (including distribution and transmission lines, substations, and installed equipment forming an integral part of the system) by which water, steam, natural gas, electricity, sewage, or other utility services are transmitted between (1) the outside of the building or structure in which the services are used, and (2) the point of origin or disposal, or the connection with some other system. It does not include communication, fuel, and high pressure air services. In addition, the Contractor is only responsible for a portion of the electrical distribution system as described throughout Section C.

Work Hour: Same as Craft Hour Unit Price (CHUP) or Labor Hour per the R.S. Means® Facilities Maintenance and Repair Cost Data Handbook.

Work Site: The actual location where the work is performed. One example of a work site is the building or room where equipment is being maintained or repaired.

END OF SECTION C2

SECTION C3**GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES****C3.1 GENERAL**

In accordance with the Government property clauses in Section G (1852.245-71, Installation-Accountable Government Property, Alternate I, and 1852.245-77, List of Government Property Furnished Pursuant to FAR 52.245-2), and the following paragraphs, the Government will furnish or make available to the Contractor certain Government owned facilities, equipment, and utilities for use in connection with this contract. The use of Government furnished property and services for other purposes is prohibited. All such facilities and equipment will be provided in "as is" condition. The Government may, at its discretion, provide the Contractor additional Installation-Accountable Materials (IAM) and Installation-Accountable Equipment (IAE) beyond those listed in this specification, if available, throughout the term of this contract.

C3.1.A Installation-Accountable Facilities (IAF). The Government will furnish or make available to the Contractor the facilities listed in Attachment 2.03.01, Section J. Should the Contractor choose to use the IAF, adequate precautions shall be taken by the Contractor to prevent fire hazards and objectionable odors. All IAF will receive the normal services (i.e. emergency, security, janitorial, refuse, and local site mail services) provided at Moffett Field for the building classification. Any new services or utilities installed will be at the expense of the Contractor. The Contractor shall notify the COTR and obtain written approval from the Contracting Officer prior to making any modifications or alterations to the facilities. Any such modifications or alterations approved by the Government will be made at the expense of the Contractor, including construction permitting if applicable. At the completion of the contract, all facilities shall be returned to the Government in the same condition as received, except for reasonable wear and tear. The Contractor shall be held responsible for the cost of any repairs caused by negligence or abuse on the part of the Contractor or its employees.

C3.1.B Installation-Accountable Material (IAM). It is anticipated that the Contractor shall provide all materials for the Contractor's use in connection with this fixed price portion of this contract.

C3.1.C Installation-Accountable Equipment (IAE). The Government will furnish or make available to the Contractor a limited number of tools and equipment described in Attachment 2.03.03, Section J. The Contractor shall maintain and repair the equipment per the Preventive Maintenance (PM) requirements in this contract, manufacturer's recommendations, and within the limits of liability specified in Attachment 2.03.03, Section J. Verification of the exact quantities and nomenclature of equipment shall be determined or verified by joint inventory per Paragraph C3.2, Inventory.

C3.1.C.1 Vehicles. The Contractor shall have sufficient vehicles on-hand at the start of the Base Period of performance to supplement the Government furnished vehicles to perform all the contract requirements per the work specification. Insufficient vehicles to perform contract requirements shall be treated by the COTR as defects per the deduction methodology in Attachment 4, Section J. Throughout the contract, the Contractor shall periodically replace old Government furnished vehicles classified as Type B in Attachment 2.03.03, Section J, with contractor owned vehicles.

C3.1.D Availability of Utilities. The Government will furnish the following utility services at existing locations, for use in those facilities provided by the Government and as may be required for the work to be performed under the contract: electricity, steam, natural gas, water, sanitary sewer, storm drain, and limited local communications on site. Utilities specified above will be furnished at no cost to the Contractor. However, the Contractor is responsible for all costs associated with, but not limited to, certain communication services, such as commercial

telephone lines, cellular telephones, high speed fax/data communications, PDA's, TV/video cable or satellite, etc. See Attachment 2.03.03, Section J, for Installation-Provided Equipment. The Contractor shall comply with regulatory and water conservation requirements per Section C1.4.A, General Information and Requirements; General Administrative Requirements; Directives, Instructions, Policies, and Regulations.

- C3.1.E Installation-Provided First Aid Facilities. The Contractor shall post emergency telephone numbers at the job site. Numbers shall include, but are not limited to, Project Manager, Customer Service Center, NASA Ames Dispatch Office, etc. Report all emergencies by dialing 911 on Government telephones, or (650) 604-5555 on other commercial phones. Ambulance, fire, and police services are available through these numbers 24 hours a day. The ARC Health Unit is located on Durand Road on the West end of Building 215, across from the North side of Building 235. It is open Monday through Friday, between 8:00 AM and 4:30 PM, for first responder non-life threatening care and treatment.

C3.2 INVENTORY

- C3.2.A Joint Inventory. During the Phase-In period of the Base Period, the Contractor and the Government shall conduct a joint inventory of all installation accountable facilities and equipment to be furnished to the Contractor.

- C3.2.A.1 During the inventory, the Contractor shall determine which items it chooses to accept as Government furnished and the exact quantity, condition, and serviceability of those items.

- C3.2.A.2 Items not desired for use by the Contractor shall be identified by written notification on the contract start date. Equipment not desired shall be staged by the Contractor at an on-site location indicated by the COTR for Government pick-up during the first five (5) days following the start of the Base Period.

- C3.2.A.3 The Contractor shall prepare and certify a detailed inventory listing (jointly approved by the Government and the Contractor), and maintain the inventory in a current status for the Base Period and for any option years. An electronic or hardcopy of the updated inventory shall be provided to the COTR with any changes clearly identified.

- C3.2.A.3.a The initial joint inventory report is due within one (1) week prior to the end of the Phase-In period.

- C3.2.A.3.b Current status report is the inventory that shall be updated by the Contractor within five (5) working days of any changes or discovery of any inventory discrepancies (See below Paragraph C3.2.B, Inventory Discrepancies). No further distribution of the updated inventory is required until performance of the interim or final inventory. Inventory records shall include a PM schedule and reflect maintenance performed on accepted IAE throughout the term of the contract.

- C3.2.A.3.c Interim Inventories: One (1) month prior to expiration of the Base Period and each option period, the Contractor and the Government shall conduct a joint inventory of all Government facilities, equipment, and any materials entrusted to the Contractor. Interim inventories shall include the actions discussed in Paragraphs C3.2.A.1 through C3.3.2.A.3. Any Government property turned over to the Government for disposal shall be clearly identified. Interim inventory reports are due prior to expiration of the Base Period and each option period.

- C3.2.B Inventory Discrepancies. The Contractor shall provide a report electronically or by hardcopy of inventoried discrepancies as they are discovered or suspected which shall be forwarded to

the COTR within five (5) working days of the reported discrepancy. The Contractor shall make reimbursements to the Government as described in Paragraph C3.2.C, Inventory at Contract Completion.

C3.2.B.1 Loss or Damage of IAE. The Contractor shall reimburse the Government for any loss of IAE, or replace or repair damaged IAE at Contractor expense. The COTR will determine current value based on initial value depreciated over the lifetime expectancy of the item using a straight-line depreciation method.

C3.2.C Inventory at Contract Completion. One (1) month prior to expiration of the contract, or at the direction of the Contracting Officer, the Contractor and the Government shall conduct a final joint inventory of all Government facilities, equipment, and any materials entrusted to the Contractor. The final inventory report provided by the Contractor is due upon contract completion, or at the direction of the Contracting Officer.

At the completion of the contract (including option periods, if any), the Contractor shall return the same property equal in type, kind, quality, and quantity of items as originally furnished by the Government and accepted by the Contractor, exclusive of those items of equipment turned over to the Government for disposal during the course of performing the contract. At contract termination, the Contractor shall return all Contractor replaced equipment for which title was vested in the Government. Such property shall be in the same or better condition as when originally furnished except for normal wear and tear. The final inventory, jointly conducted, will determine equivalent monetary value required by the Government to repair or replace facilities, equipment, or material. The Contractor shall reimburse the Government at the value or estimated amount established at the initial inventory. This amount shall be withheld from the Contractor's invoice and shall be deducted from the final contract payment by the Government.

END OF SECTION C3

SECTION C4**CONTRACTOR FURNISHED ITEMS****C4.1 GENERAL**

Except for items listed in Section C3.1 as INSTALLATION-ACCOUNTABLE PROPERTY AND SERVICES, the Contractor shall provide all facilities, equipment, materials, and services to perform the requirements of this contract. The Contractor shall assure that all required materials and parts are readily available within the timeframes required for recurring work, including preventive maintenance (PM) and trouble call (TC) requirements.

- C4.1.A Materials. The Contractor shall provide new or factory reconditioned parts and components when practicable in providing maintenance and repair services as described herein. All replacement units, parts, components, and materials to be used in the maintenance, repair, and alteration of facilities and equipment shall be compatible with existing equipment on which it is to be used; shall be of equal or better quality than original equipment specifications; shall comply with applicable Government, commercial, or industrial standards; shall conform to the SI units of measurement when it is most cost effective for the Government; shall conform to the applicable specifications listed in the technical specifications, Section C; and, used in accordance with original design and manufacturer intent. Items not listed in the technical specifications shall be of acceptable industrial grade and quality. If the original manufacturer has updated the quality of parts for current production, parts supplied under this contract shall equal or exceed the updated quality.

Prior to the end of the Phase-In period, the Contractor shall have all materials on site to fully support and implement the requirements and objectives of this contract. All bin stock items shall be readily available to perform all maintenance job functions at start of contract.

- C4.1.B Contractor's Site Office. The Contractor shall maintain an office (on or off Government property) with a local telephone number at which the Contractor or its designated representative may be reached at all times (24 hours a day, seven (7) days a week) during the contract period (same as Customer Service Center requirement, See Section C5.2.D.1, Firm Fixed Price Work; Trouble Calls; Processing Trouble Calls; Notification Procedures). A telephone answering machine is not acceptable. Acceptable methods for after regular working hours include on-site staff, a paging beeper, telephone answering service, voice page, etc. The Contractor shall respond to all calls within ten (10) minutes following initial notification. The Contractor shall immediately notify the Contracting Officer of any change in the telephone number(s) or contacting procedures.

- C4.1.C General Office Furniture and Supplies. The Government will not provide furniture under this contract except for all full-time personnel under Section C20, Environmental and Emergency Support Services. Furniture supplied will be used condition, standard Government issued items, and what is available in surplus at time of need. The Contractor shall furnish all supplies (e.g. copy, photo, and drawing paper, toner, ink cartridges, etc.) for all fixed-price work requirements stated throughout Section C.

END OF SECTION C4

SECTION C5**FIRM FIXED PRICE WORK****C5.1 GENERAL REQUIREMENTS**

General Intention. The Contractor shall perform all Trouble Calls (TC), recurring services including Preventive Maintenance (PM) and Predictive Maintenance (PdM), operations, and storm related response support, as described herein under the firm fixed price portion of the contract. A Facility Equipment Listing, Attachment 2.05.01, Section J, and Facility Equipment Location Maps, Attachment 2.05.02, Section J, provide specific information and location of equipment in existing facilities. The Contractor shall keep the location maps and equipment inventory current for the duration of this contract. During the Phase-In period, the Contractor shall assess the needs of the contract so that, on the first day of the base period after phase-in, the Contractor shall perform the work program satisfactorily and in a safe manner. TC and recurring services work constitute the majority of the firm fixed price portion of this contract. The Contractor shall ensure recurring services work is given the priority and staffing resources it deserves in order to accomplish all assigned work within the specified frequencies or parameters. Work delays due to a lack of required labor or materials shall not be an acceptable cause for non-performance of work.

C5.2 TROUBLE CALLS (TC)

C5.2.A Definition and Limitations. A TC is defined as an unscheduled request for work of a one-time nature typically issued to correct, repair, or restore a minor structural, mechanical (including plumbing and irrigation), electrical, or environmental deficiency, requiring little detailed management control, and which does not exceed \$2500 in total labor and material cost as determined by R.S. Means® standards (hereafter referred to as the "limit"). To gauge the scope and skills required for TC work, the TC historical workload data is shown in Attachment 2.05.03, Section J, and a listing of actual trouble calls is contained in Attachment 2.05.05, Section J. The responsibility to perform work under a single TC ends when the Contractor notifies the COTR that the work is estimated to exceed the TC limit specified after physically exposing and visually inspecting the problem area, or determining that the work is clearly over the TC limit. Adequate justification shall be provided in writing demonstrating why the Contractor is unable to complete the work within the TC limit. The Government reserves the right to reject the justification if it is determined unacceptable. Any effort expended and costs incurred by the Contractor prior to such notification is considered part of the original fixed price TC and will not be applied toward any Indefinite Delivery Indefinite Quantity (IDIQ) work which may result. For critical and urgent call limits, see Paragraphs C5.2.C.1 and C5.2.C.2.

C5.2.B Workmanship and Materials. The level of repair provided by the Contractor shall assure that any item included in a TC is free of missing components or defects which would affect the safety, pleasing appearance, or habitability of the facilities, or would prevent any structural members, mechanical (including plumbing and irrigation) systems, or electrical equipment from functioning per the intended design or use. Corrected or repaired work shall be carried to completion, including touch-up painting or operational checks. The quality of work and the repaired areas shall be fully compatible with adjacent surfaces or equipment. All replacement material shall match existing dimensions, materials, quality of work, finish, color, design, and function, unless otherwise specified. During performance of work, debris shall not be allowed to spread unnecessarily into adjacent areas nor accumulate in the work area itself. All such debris, excess material, and parts shall be removed upon completion of work or at the end of each work day, whichever occurs first. Upon completion of work, any fingerprints, stains, surface degradations, and other unsightly visual appearances caused during performance of work shall be removed.

C5.2.C Classification of Trouble Calls. The Contractor shall perform TC to correct deficiencies at various locations of facilities, structures, and utilities that are a part of Ames Research Center (ARC), Moffett Airfield Complex (MAC), and selected utilities, alarm systems, and grounds maintenance associated with Moffett Housing Annexes (MHA). All TC occurring on MHA property and at Resident Agency (RA) occupied MAC buildings that require further labor and materials to complete once the situation is arrested, shall be brought to the attention of the COTR for approval. Unless an agreement is in place between other agencies and NASA, no work shall be performed. A list will be provided to the Contractor by the COTR as needed listing other agencies with agreements and specific instructions. Additional work to complete the TC shall be accomplished at the Government's discretion per Sections C7.2 and/or C7.3, Indefinite Delivery Indefinite Quantity Work; Craft Hour Unit Price (CHUP) Work. All TC are classified as follows:

C5.2.C.1 Critical Calls. Critical calls are issued for situations that require immediate action to eliminate hazards to personnel, equipment, or environment; prevent loss of or damage to Government property; or to restore essential services that have been interrupted by an unplanned event. The Contractor shall respond within ten (10) minutes following notification during regular working hours and within one (1) hour following notification after regular working hours. If further labor and material are required to complete the repair once the emergency is arrested, completion shall be within five (5) working days following notification of the critical call, unless stated otherwise within the technical portion of this specification. If the TC limit is reached during corrective operations, the Contractor shall immediately notify the COTR and continue work up to the point at which the emergency is arrested by stabilizing the situation to eliminate personnel hazards and further damage to Government property (at no dollar limit to the Contractor). Costs incurred to stabilize the critical condition which exceed the TC limit will be reimbursed using: (1) R.S. Means® standards for labor, material, and equipment; (2) the contract unit prices for IDIQ work; or (3) the actual cost by the company performing the work showing labor, material, and equipment expended during performance. The Contractor shall provide a detailed breakdown of such costs for Government approval and payment under IDIQ work. Remaining critical work if required to complete the TC, or additional work exceeding the TC limit shall be accomplished at the Government's discretion per Sections C7.2 and/or C7.3, Indefinite Delivery Indefinite Quantity Work; CHUP Work.

C5.2.C.2 Urgent Calls. Urgent calls are issued for situations which do not immediately endanger personnel or threaten to damage property or the environment, but would soon inconvenience and affect the health or well being of personnel or disrupt operational missions or projects. The Contractor shall contact the customer within 30 minutes following notification, and shall physically respond to urgent TC within four (4) hours following notification of the call both during and after regular working hours. All urgent calls must be completed within five (5) working days following notification of the call. If the TC limit is reached during corrective operations, the Contractor shall immediately notify the COTR and continue work up to the point at which the urgency is arrested. Costs incurred to stabilize the urgent condition which exceed the TC limit will be reimbursed using: (1) R.S. Means® standards for labor, material, and equipment; (2) the contract CHUP rates for IDIQ work; or (3) the actual cost by the company performing the work showing labor, material, and equipment expended during performance. The Contractor shall provide a detailed breakdown of such costs for Government approval and payment under IDIQ work. Remaining urgent work if required to complete the TC, or additional work exceeding the TC limit, shall be accomplished at the Government's discretion per Sections C7.2 and/or C7.3, Indefinite Delivery Indefinite Quantity Work; CHUP Work.

C5.2.C.3 Routine Calls. Routine calls are for all other calls that do not qualify as a critical or urgent call. The Contractor shall complete routine calls within 15 calendar days following notification, unless otherwise specified when issued. Occasionally, the COTR

will state specific dates or times for routine TC accomplishment, such as in locating utility lines, pavement cutting, providing special maintenance support for other contractors, and other atypical items of work. Should the Contractor determine that work initiated as a routine TC will exceed the TC limit, the Contractor shall return the documentation to the COTR along with a preliminary estimate for the remaining work per Section C7.3, Indefinite Delivery Indefinite Quantity Work; CHUP Work, within five (5) calendar days of stopping work. However, the Contractor shall not leave the work in an unusable condition, any unsafe condition, any condition that creates a security violation, or any condition that may cause further damage or destruction. Remaining routine work exceeding the TC limit shall be accomplished at the Government's discretion per Sections C7.2 and/or C7.3, Indefinite Delivery Indefinite Quantity Work; CHUP Work.

C5.2.D Processing Trouble Calls.

C5.2.D.1 Trouble Call Notification Procedures. The Contractor shall operate a Customer Service Center (on or off Government property) that will screen, classify, assign control numbers to, and issue TC to its own staff and the Government's janitorial contractor. The janitorial contractor will be responsible for all work requirements stated on the TC form that are issued to them. No critical TC work will be issued to the janitorial contractor. However, the Contractor shall be responsible for receiving, recording, reporting, and tracking all TC regardless of who performed them. All TC not assigned directly to the Contractor will be excluded from the performance requirements of this contract, and the Contractor will not be held responsible for sub-standard performance, delays by another contractor or the Government, or any customer complaints received on TC performed by other than Contractor personnel. All complaints received on TC performed by other than Contractor personnel shall be forwarded to the COTR. During regular working hours, the Contractor shall continuously maintain a telephone watch at the Contractor's Customer Service Center for immediate notification of critical and urgent TC. The Contractor shall have an individual who is fully familiar with the Contractor's work control procedures and the terms and conditions of this contract answer all telephone calls within 30 seconds. During other than regular working hours, the Contractor shall provide to the Government a toll-free pager or local telephone number where its representative can be reached 24 hours per day, seven (7) days a week. The Contractor shall contact the appropriate personnel (list to be provided by the Government prior to start of the Base Period) within ten (10) minutes following initial notification after regular working hours to determine the scope of work and location. The response time period defined for critical and urgent work shall begin with Contractor receipt of initial notification by telephone.

C5.2.D.2 Trouble Call Documentation. TC documentation consists of a TC form, of which a sample is shown in Attachment 2.05.06, Section J. A TC form will be prepared by the Contractor for each call received and completely filled out after all work has been performed on the TC to close-out the TC. TC may be disregarded and never logged into the system for invalid calls, work intended to be performed by the Government, or work outside the TC scope. TC may be combined for items that are duplicated, received the same day for the same problem, or items that are related to the same system located in the same immediate area. The Contractor shall maintain on a daily basis all records in a Computerized Maintenance Management System (CMMS) for easy accessibility by the Government at all times and produce a TC Annual Report to the COTR summarizing TCs completed by month and work classification, priority listing, and hours expended for each TC. The Contractor shall ensure that the following information has been entered on a TC form:

C5.2.D.2.a Shop Comments: Detailed description and location of actual work, including reason(s) for non-performance (if applicable) and equipment identification number(s) of unit(s) repaired corresponding to the Facility Equipment Listing in

Attachment 2.05.01, Section J. All comments must be legible. If the equipment is not listed in Attachment 2.05.01, Section J, or is replaced during performance of the work, the Contractor shall provide nomenclature information, specific location marked on the applicable Facility Equipment Location Maps, Attachment 2.05.02, Section J, and annotated copies of the affected pages. The Contractor will assign a new unique number to the equipment, revise the listing, update map pages, perform acceptance testing where applicable and document, and notify the COTR of the changes.

- C5.2.D.2.b Date/Time Received: Date and time TC received (verbal notification, where applicable).
- C5.2.D.2.c Date/Time Started: Date and time Contractor arrived at job site, exclusive of travel time.
- C5.2.D.2.d Date/Time Completed: Date and time Contractor completed required work.
- C5.2.D.2.e Material Costs: Description, quantity, and total cost of materials.
- C5.2.D.2.f Hours Used: Actual labor hours expended at the job site.
- C5.2.D.2.g Craftsperson: Signature of person(s) who performed the work.
- C5.2.D.3 The Contractor shall submit a TC Status Report daily to the COTR showing all the active TC received, started, delayed, completed, and its current status as an electronic spreadsheet. In addition, TC Documentation shall include an annotated copy of the applicable sheet(s) of the Facility Equipment Listing and Location Map(s), Attachments 2.05.01 and 2.05.02, Section J, and shall accompany completed TC documentation whenever repair by replacement of specific equipment occurs, or equipment is added or deleted to the database.
- C5.2.E Trouble Call Work Status and Performance. The Contractor shall respond to questions within two (2) hours of receipt from the COTR as to the status of any TC work. The Contractor shall be required to maintain sufficient quantities of materials on hand or have available an immediate source of supply to support TC work. Lack of such materials shall not be considered an acceptable cause for non-performance. The Contractor shall troubleshoot and repair any incidental and related damage as a result of the initial service being performed. For example, if the TC is to repair a roof leak, the Contractor shall also replace any ceiling tiles or repair other related items damaged as a result of the leaking roof within the scope and limit of the particular TC. Another example is a TC for tripped circuit breaker, where the Contractor shall analyze the power situation to determine cause of outage, monitor amperage for usage, reset or replace circuit breaker in the panel, and verify and update panel schedule if incorrect or not labeled. All work exceeding the TC limit shall be accomplished at the Government's discretion per Section C7.3, Indefinite Delivery Indefinite Quantity Work; Craft Hour Unit Price (CHUP) Work.
- C5.2.E.1 Critical Calls. For all critical calls, the Contractor shall follow the standard operating procedures for reporting purposes. The Contractor shall notify the TC requester by telephone, electronic mail, site visit message, or fax of the work status within one (1) hour from initial receipt for all critical calls, and every four (4) hours afterwards during regular working hours, or once daily during non-regular working hours until the TC is completed unless requestor modifies this procedure.
- C5.2.E.2 Urgent Calls. For all urgent calls, the Contractor shall notify the TC requestor by telephone, electronic mail, site visit message, or fax of the work status within one (1) working day from initial receipt for all urgent calls, and every two (2) working days afterwards until the TC is completed, closed out, or requestor modifies this procedure.

- C5.2.E.3 Routine Calls. For all routine calls, the Contractor shall notify the TC requester of the work status within two (2) working days from initial receipt for all routine calls, and every seven (7) working days afterwards until the TC is completed and closed out.

C5.3 RECURRING SERVICES

Recurring services are defined as maintenance type work performed on scheduled frequencies or repetitively throughout the term of the contract. Although routine, recurring services require planning, scheduling, trending, and frequent quality control monitoring by the Contractor and are accomplished without further input from the Government. All recurring services are included in the firm fixed price portion of the contract. Recurring services in this contract include Preventive Maintenance (PM), Predictive Maintenance (PdM), other programmed maintenance and repair work, and scheduled services. PT&I is included as part of PdM which involves technically skilled personnel performing recurring services on the part of the Contractor.

C5.3.A Preventive Maintenance (PM)

- C5.3.A.1 Definition and Repair Limitation. The Contractor shall accomplish all PM work within the firm fixed price portion of this contract. PM is defined as routine, periodic maintenance, and incidental repair requirements associated with facility and utility systems and dynamic equipment, for which no specific operators are assigned. PM is concerned primarily with items that, if disabled, would interfere with an essential operation, endanger life and property, or involve high cost or long lead time for replacement. PM work includes, but is not limited to, visual, operational, and safety inspections, cleaning, re-labeling items, corrosion removal and related maintenance painting, adjustment, alignments, lubrication, and replacement of filters, belts, fasteners, hoses, and other expendable items required to correct or minimize operational wear and deterioration of facility systems and equipment. PM work is continuous and repetitive in nature, is accomplished within the framework of comprehensive and detailed short and long term PM schedules, and requires diligent and continuous program management by the Contractor. The Contractor shall accomplish incidental repair of defective equipment or system components detected at the time of PM performance. The Contractor's repair work liability is limited by the TC limit specified in Paragraph C5.2, Trouble Calls, per system, per occurrence, unless specified elsewhere. Repair work exceeding this limit shall, upon notification by the Contractor, be accomplished at the Government's discretion per Section C7.3, Indefinite Delivery Indefinite Quantity Work; CHUP Work. However, the Contractor is liable for the full cost of any repair or replacement item(s) if the Government determines that the cause of failure, malfunction, or damage to equipment or systems, where the cost exceeds the TC limit, was directly related to lack of PM work by the Contractor. The repair or replacement cost for the item(s) will be deducted from the Contractor's invoice. The only exception will be for equipment items that are classified as "run to failure".

- C5.3.A.2 General PM Requirements. Specific PM work requirements are identified in Sections C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, and C19.

- C5.3.A.3 Management of the Program. PM work constitutes a significant portion of the firm fixed price portion of this contract. The Contractor shall ensure PM work is given the priority, staffing resources, and quality control oversight it deserves in order to accomplish all assigned work within the specified frequencies or parameters. The COTR shall be notified of any PM missed, postponed, or delayed that went beyond the scheduled frequency range stated in any critical facility. Lack of required spare parts, other required materials, and/or process work flow impediments which delays PM work shall not be an acceptable cause for non-performance of PM work. During the Phase-In period, the Contractor shall assess the spare parts needed by this contract so that, on

the first day of the Base Period after phase-in, the Contractor shall perform the PM program satisfactorily. The Contractor shall develop and submit monthly work schedules, identifying the specific equipment by location and date, to the COTR as part of the Contractor's overall maintenance operations program. Failure to provide any part of this schedule may cause delays in payment of the Contractor's invoice. (See Section C1.3, General Information and Requirements; General Management and Control Requirements, for additional information about schedule requirements).

C5.3.A.4 Standards and PM Work. The Contractor shall perform PM work using the requirements specified in the technical section of this specification, and further referenced in directives, instructions, and manuals listed in Attachment 2.06.01, Section J. The current anticipated PM standards are shown in Attachment 2.05.07, Section J, PM Checklists. The Contractor shall use these PM Checklists as a guideline in developing their own PM Maintenance Program. The Government will use these PM Checklists to determine adequacy of the Contractor's PM Maintenance Program. The Contractor has full authority to change any of the guidelines on the checklist sheets as long as good rationale is provided to the Government in writing for the deviation(s). Terms including "check", "ensure", and "verify" shall mean to visually observe or measure, adjust, clean, maintain, repair, or replace as required. After PM work is complete, the equipment shall be operated over a complete cycle or at regular operating conditions for a minimum of five (5) minutes to observe and document applicable pressure and temperature readings, any unusual mechanical conditions, and record applicable acceptance test measurements. The Contractor shall perform cleanup following PM, and provide a neat and orderly environment in mechanical rooms and other equipment areas as part of PM work. Equipment and parts storage in equipment rooms is prohibited unless approved by the Government. Dust, dirt, garbage, and old parts present in any equipment room that was a direct result of the PM work performed by the Contractor shall be removed during cleanup following PM work. Other miscellaneous items in any equipment room that are present due to external factors shall be brought to the attention of the COTR for resolution.

C5.3.A.5 Reporting of PM, Deficiencies, and Repair. The Contractor shall identify and document all work performed in the CMMS including technician notes using the accepted maintenance procedures, including observed operating conditions and instrumentation readings, deficiencies detected and corrected, deviations outside normal parameters from observations and any PT&I test results, and quantities and types of material repaired or replaced on a regular basis, for historical records. All records shall be made available to the COTR within one (1) working day following work completion if requested. In addition, the Contractor shall submit a monthly report addressing any PM deficiencies and repairs stating reasons why PMs are deficient (use non-performance codes if applicable). Records are discussed in Section C1.3.F, General Information and Requirements; Management and Control Requirements; Records and Reports. If the equipment is not listed in Attachment 2.05.01, Section J, or is replaced during performance of PM work, the Contractor shall provide nomenclature information, specific location marked on the applicable Facility Equipment Location Maps, Attachment 2.05.02, Section J, and annotated copies of the affected pages. The Contractor will assign a new unique number to the equipment, revise the listing, update map pages, and notify the COTR of the changes.

C5.3.A.6 Timeliness. The Contractor should recognize that untimely response to repair requirements and lower levels of PM will result in increased repair frequencies and additional material costs. At the Contractor's option, and at no additional cost to the Government, the PM schedule can be increased at any time to minimize repair requirements. In addition, with Government approval, the PM schedule can be reduced or maintenance approach changed (for example, substituting PT&I for a time-based PM activity or changing PM frequencies). The Contractor is advised that PT&I data under condition monitoring, when technically feasible, will be required to support reductions in

PM or to perform IDIQ repair work. The Government will accept all reductions in PM tasks or frequencies if it supports a proactive RCM program and is supported by a rational decision that is beneficial to the Government. The Government will provide to the Contractor technical documents that show the manufacturer's recommended PM schedule, as available, and other available manuals, pamphlets, and other relevant information. In addition, the proposed PM Checklist sheets based on the current PM work orders are shown in Attachment 2.05.07, Section J.

C5.3.A.7 Workmanship and Materials. All PM work shall be of professional quality conforming to all applicable codes and standards, and all specified work items such as checkpoints, servicing, repairs, and reporting shall be performed completely, correctly, and neatly in a safe manner. All repair work shall be fully warranted against defects due to material and workmanship for a period of 90 days following completion of repair, non-warranty parts included. However, any other expressed or implied warranties included within this contract or warranties expressed by the manufacturer or supplier shall take precedence over the 90-day warranty period. The Contractor is not obligated to extend any manufacturer or supplier warranty.

C5.3.B Predictive Maintenance (PdM).

The Contractor shall perform PdM based on PT&I technologies available and failure modes and effects analysis (FMEA). The PdM program shall take into consideration the risk of significant research loss if equipment fails, possible cost savings, safety, and regulatory requirements. Responsibilities shall involve continuous evaluation of preventive maintenance procedures and effectiveness of the program, equipment trending with recommended improvements, analyzing and defining patterns of distress or abnormal operating parameters, performing historical inquiries into identified issues, planning and scheduling needed repairs at optimum times, and development of PdM techniques and procedures including failure codes to avoid machinery functional failures and improve the RCM program on a day-to-day basis. The primary goals are to be in line with best industry practices and be economically beneficial. All PdM issues shall be documented, results shared with the Government to analyze and review, and any corrective action necessary shall be implemented by the Contractor to optimize the overall maintenance program including changes to the preventive and predictive procedures and frequencies.

C5.3.B.1 Predictive Testing and Inspection (PT&I). The Contractor shall perform PT&I on the applicable equipment and systems listed in Attachment 2.05.01, Section J, in accordance with the PT&I technologies outlined in Attachment 2.05.09, Section J. If the Contractor determines new "state of the art" or alternate technology is available that is not listed in this section, the Contractor shall use this technology at its discretion provided it improves the prediction of equipment and system conditions. If the Contractor decides to implement technologies different from what is outlined in Attachment 2.05.09, Section J, the COTR shall be notified of the change. PT&I is used to assess the material condition of the inspected equipment and systems. In addition, the Contractor shall complete all repair requirements identified during the performance of a PT&I as part of the PT&I if the total cost does not exceed the TC limit. Work exceeding the TC limit shall, upon notification by the Contractor, be accomplished at the Government's discretion per Section C7.3, Indefinite Delivery Indefinite Quantity Work; CHUP Work. The TC limit applies to each PM inspection for each individual piece of equipment or equipment system. All PT&I results and reports become Government property and shall be accessible to the Government at all times during the course of this contract. All PT&I data collected (including finds and cost avoidance) shall be input into the appropriate fields and modules of RBMware®, or an equivalent Government approved reliability centered maintenance software program for PT&I data. The Contractor shall submit one copy of all reports generated to the COTR on a monthly basis. The PT&I report shall include, but is not limited to, the number of new finds, equipment that has gone into alarm, cost avoidance due to PT&I, and trends.

- C5.3.B.2 Acceptance of New Equipment. The Contractor shall participate in the acceptance process of all newly installed equipment of value at ARC to improve initial equipment condition and eliminate installation defects. Acceptance of new equipment installed by the Contractor shall be automatically included as part of the project(s), performed and documented in accordance with stated procedures per Chapter 8 of NPR 8831.2E. Typical instrumentation used includes sound disks, accelerometers, control boxes/wiring, etc. The COTR will notify the Contractor of acceptance participation dates when other contractors have installed machinery and equipment outside of this contract. The Contractor shall apply the PT&I technologies outlined in Attachment 2.05.09, Section J, to obtain initial data for comparisons to acceptance standards. Any data falling outside the acceptable ranges shall be reported immediately to the COTR for resolution. All data results shall be documented in the appropriate CMMS and PT&I databases and also submitted to the COTR including a summary page of highlights.
- C5.3.B.3 Failure Modes and Effects Analysis (FMEA). The Contractor shall perform FMEA as part of the overall RCM program on a continuous basis with or without direct guidance from the Government. All equipment of significant value that fails for unknown reasons or a maintenance related process that causes equipment downtime with monetary losses shall be documented through the FMEA process. An FMEA shall contain information addressing functional failure, dominant failure modes, failure cause and effect including root cause failure analysis, and recommended actions and knowledge gained to eliminate or prevent the risk of recurrence. The COTR may request FMEA from the Contractor on any maintenance related issue that is a concern to the Government. All FMEA documentation shall be supplied to the COTR when complete.

C5.4 OPERATIONS

- C5.4.A Operations Requirements. Operations is defined as attendance type work requiring the presence of one (1) or more qualified persons during a specified time period. TC will not be issued for operations work when the attendant(s) is on regular duty as defined in this paragraph. Labor effort to: 1) accept, track, duplicate, notify, and issue documentation to customers; 2) update drawings and CADD files, document changes, and reproduce and issue documentation to COTR; 3) correct equipment malfunctions, breakdowns, and related repair deficiencies that occur; shall be considered as part of the operations requirement and is included under the firm fixed price portion of the contract. The Contractor's fixed-price repair work is limited to \$750 of Contractor provided material (excluding rented or owned equipment costs which are handled under Section C7.3, Indefinite Delivery Indefinite Quantity Work; CHUP Work) per system, per occurrence, unless specified elsewhere. Repair work exceeding this \$750 material limit shall, upon notification by the Contractor, be accomplished at the Government's discretion per Section C7.3, Indefinite Delivery Indefinite Quantity Work; CHUP Work. In addition, an annotated copy of the applicable page(s) of the Facility Equipment Listing, Attachment 2.05.01, Section J, shall accompany completed PM or other operations documentation whenever repair by replacement of specific equipment occurs. The Contractor will assign a new unique number to the equipment, revise the listing, update map pages, and notify the COTR of the changes.
- C5.4.A.1 Customer Service Center Requirements. The Contractor shall staff and operate the day-to-day Customer Service Center functions at ARC 24/7. Work entails handling telephone calls and email messages, classifying TC, assigning control numbers to documentation, issuing TC, providing notifications, documenting customer complaints and resolving issues from start to closure, disposition of issues or inquiries, documenting operating procedures, and keeping records up-to-date. For Trouble Call Desk procedures, see Paragraph C5.2.D, Processing Trouble Calls.
- C5.4.A.2 Facility Management Control System (FMCS) Requirements. The Contractor shall staff and operate the day-to-day FMCS functions at ARC 24/7. Work entails equipment

monitoring and optimum performance of the FMCS including response to maintenance alarms, maintenance engineering support, field technician support for PM and PdM activities, and repair or alteration of the Moffett Boiler Plant and its associated external equipment and distribution system on a limited basis. Any alterations to existing operational systems that may affect the performance of the system or other systems shall be approved by the COTR prior to commencement of system alteration.

C5.5 ADVERSE WEATHER CONDITION RESPONSE SUPPORT

- C5.5.A Preparation. The Contractor shall prepare for any adverse weather condition by providing increased maintenance activities prior to the arrival of the adverse weather condition. Preparation shall include but not be limited to: 1) mobilization of portable pumps and generators to include functionality tests, hookups, and containments; 2) covering exposed areas or project sites as required with tarps and tie-downs; 3) maintenance of other portable equipment and materials in stand-by mode for deployment readiness; 4) inspection and clearing of debris from storm drainage system; 5) pruning and clearing trees, branches, and shrubs that could pose threat during high winds or icing conditions.
- C5.5.B Response. The Contractor shall increase monitoring of machinery and equipment during adverse weather conditions and be prepared to respond to maintenance related activities as they occur. Updates shall be provided to the COTR on response activities on a regular basis during each incident. Response afterwards shall include demobilization of equipment, returning items to home locations, and notation of any issues that occurred.
- C5.5.C Post-Response. The Contractor shall inspect all outdoor machinery and equipment including, but not limited to, the following: transformers, fixed generators, portable devices deployed, all secondary containments open to weather conditions, and all storm drainage systems.
- C5.5.D Cost and Limitation. The Contractor shall respond to all adverse weather conditions on a 24-hour, seven (7) day per week basis. The Contractor is responsible for preparation and response costs (excluding repair costs unrelated to each incident and/or labor costs that would have been incurred during the normal working day this event took place) up to \$10,000 to be included as part of the firm fixed price contract work. The total liability cost to the Contractor is \$10,000 per adverse weather condition. Total costs per incident that exceeds \$10,000 will be covered at the Government's discretion per Section C7.3, Indefinite Delivery Indefinite Quantity Work; CHUP Work.

END OF SECTION C5

SECTION C6**DOCUMENTATION AND REPORTING REQUIREMENTS SUMMARY****C6.1 GENERAL REQUIREMENTS**

This section lists all the documents and reports required by the Government for the Statement of Work only. The specific details are shown in each section of this Statement of Work. For a complete listing of all contractual reporting requirements including format, recipients, and delivery dates, see Section F.3, Delivery of Reports.

C6.2 TECHNICAL REPORTING REQUIREMENTS**SOW REF REPORT TITLE**

Section C1

C1.2.D.1	Quality Control Plan (QCP)
C1.2.D.2	Quality Control Inspection Record
C1.2.P	Verification of Licensing, Certifications, and Specific Experience Requirements
C1.3.B	Status Reports on Work in Progress or Tasks Completed
C1.3.D.2	Initial Work Schedule (baseline)
C1.3.D.3	Monthly Work Schedule (MWS)
C1.3.E.1	Initial Operation Procedures Plan
C1.3.E.2	Operation Procedures Follow-On Plans
C1.3.F.1	CMMS Operations, Maintenance, and Management
C1.3.F.2	Contract Task Order (CTO) Status Report
C1.3.F.3	Performance Metrics Report
C1.3.F.4	Contract Hours Per Building Report
C1.3.F.6	Contract Completion Records and Reports
C1.4.F.4	Contractor Monthly Accident Report
C1.4.F.4	NASA Mishap Report (Incident Reporting Information System)
C1.4.F.5	Damage to Government Property, Equipment, or the On-site Environment
C1.4.K.1	List of Names and Employee Roster

Section C3

C3.2.A.3	Initial Joint Inventory Report of Installation-Provided Facilities, Equipment & Materials
C3.2.A.3	Current Status Inventory
C3.2.A.4	Interim Inventory Report of Installation-Provided Facilities, Equipment & Materials
C3.2.B	Inventory Discrepancies
C3.2.C	Final Inventory Report of Installation-Provided Facilities, Equipment & Materials

Section C5

C5.2.D.2	TC Annual Report
C5.2.D.3	TC Status
C5.2.D.3	TC Documentation: An annotated copy of applicable sheet(s) of the Facility Equipment Listing and Location Map(s) shall accompany completed TC documentation
C5.3.A.3	Management of the Program
C5.3.A.5	PM, Deficiencies, and Repair
C5.3.B.1	Monthly PT&I Report
C5.3.B.2	Acceptance of New Equipment Report
C5.3.B.3	FMEA Report(s)

Section C7

- C7.2.B Preliminary Cost Estimate
- C7.2.C Detailed Cost Estimate
- C7.4 Complete Contract Task Order package

Section C8

- C8.6.A Meter Reading Monthly Report
- C8.6.B Meter Inventory Annual Report
- C8.6.C Fuels Reading Quarterly Report
- C8.6.D Energy Quarterly Report
- C8.6.E Data for the Energy Annual Report
- C8.6.F Energy and Water Reduction Plan

Section C9

- C9.6.A Pavement Assessment & Repair Plan

Section C10

- C10.6.A Landscape Monthly Report
- C10.6.B Landscape Annual Report
- C10.6.C Tree Inventory Annual Report
- C10.6.D IPM Program and Chemical Use Monthly Report
- C10.6.E IPM Program Plan

Section C11

- C11.6.A Monthly Progress Reports
- C11.6.B Annual FMCS Plan
- C11.6.C Incident Report

Section C12

- C12.6.A Fire Hydrant Annual Inspection Report
- C12.6.B Automatic Fire Sprinkler System Quarterly Inspection Report
- C12.6.C Semi-Annual Calibration Report
- C12.6.D Emergency Shower/Eyewash Inspection Report
- C12.6.E Water Heaters Annual Report
- C12.6.F Backflow Prevention Devices Inspection Report
- C12.6.G Grease Trap Report

Section C13

- C13.6.A Roof Documentation
- C13.6.B Facility Condition Assessment Report
- C13.6.C Monthly Roofing Report
- C13.6.D Annual Paint Usage Report
- C13.6.E Building Maintenance, Repair, and Cost Profiles Report

Section C14

- C14.6.A Equipment Certifications on Elevators and Air Compressor Tanks
- C14.6.B Oily Water Separators Report

Section C15

C15.6.A Bi-weekly Status Report
C15.6.B Steam Trap Survey
C15.6.C Calibration Report
C15.6.D Boiler Water Sampling Laboratory Results
C15.6.E Boiler Tuning Results and Certification Annual Report

Section C16

C16.6.A Boiler Bi-weekly PM Status Report
C16.6.B Boiler and Chiller Annual PM Report
C16.6.C Calibration Report
C16.6.D Chemical Water Treatment Report

Section C17

C17.6.A Transformer Quarterly Report
C17.6.B Transformer Annual Report
C17.6.C Generators Operating Hours Monthly Report
C17.6.D Generators Monthly Inspection Report
C17.6.E Generators Annual Inspection Report
C17.6.F Discrepancy Report

Section C18

C18.6.A Inspection and Testing Monthly Report
C18.6.A Annual Certification Report
C18.6.B Lifting Devices Maintenance Procedures Plan

Section C19

C19.6.A Documentation
C19.6.B Engineering Reports

Section C20

C20.6.A Initial ESH Plan
C20.6.A Final ESH Plan
C20.6.A.3 Records of Pumping Electrical and Communication Vaults
C20.6.A.4 Resin Filtration System Log
C20.6.B Annual Pollution Prevention Plan
C20.6.C Annual Solid Waste Prevention and Recycling Goals
C20.6.D CFC and HCFC Monthly Reports
C20.6.E Hazardous Material Inventory and Tracking Report
C20.6.E.1 MSDSs of all chemicals to be used on this contract
C20.6.E.2 Hazardous Waste/Substance Spill Report
C20.6.F Remediation Activity Report
C20.6.G Soil Sample Results Monthly Report
C20.6.H Tub Grinder Operating Hours Report

END OF SECTION C6

SECTION C7**INDEFINITE DELIVERY INDEFINITE QUANTITY WORK****C7.1 GENERAL REQUIREMENTS**

- C7.1.A** Definition. Indefinite Delivery Indefinite Quantity (IDIQ) work is unscheduled, non-recurring specific facilities maintenance and repair work consisting of Craft Hour Unit Price (CHUP) work, which may be ordered by the Government from the rate schedules of IDIQ work in Attachment 1.03, Section J, on an as-needed basis during the course of this contract. The Contractor or the Government may initiate IDIQ work, but work shall not begin without an approved Contract Task Order (CTO). (See Section I, FAR 52.216-18, Ordering). A sample contract task order form is shown in Attachment 2.07.01. The CTO package, which may include attached sketches and additional specification sheets, will clearly identify the scope and location of desired work prior to authorization by the Government to commence work. The Contractor shall include as part of the firm fixed price (FFP) work the preliminary scoping activities, planning sequences, estimating time, and scheduling efforts of all IDIQ work as part of the FFP work shown under Section C7 on Attachment 2.02.02 of Section J. Cost estimating ranges from developing and submitting preliminary estimates for budgeting purposes to extensive detailed estimates for larger projects. The Contractor will be paid a fixed price for each CTO issued following final completion and acceptance of work. Any additional fixed price IDIQ work beyond what is stated, if proposed, shall be compensated for as part of all the CHUP rates for IDIQ work.
- C7.1.B** Work Requirements. The Contractor shall complete IDIQ work within the timeframe specified on the CTO form unless modified by the Government in writing by the COTR and approved by the Contracting Officer. Completion requirements will be based on the Government's needs, impact on mission or project requirements, management interest, and when possible, the impact on the Contractor. At the time each CTO is issued, the COTR will assign a cost estimate category number and provide a target completion date on the form. If the CTO does not specify a timeframe, the Contractor shall target completion dates for IDIQ work to be within 20 working days when the CTO total amount is equal to or less than \$5000, 25 working days between \$5000 and \$15,000 inclusive, 30 working days between \$15,001 and \$25,000 inclusive, and 60 working days for a CTO greater than \$25,000. Actual completion date determinations will be prepared by the Contractor in consultation with the customer after the CTO is issued but before work commences. The CTO form must be signed by the customer prior to submitting to the COTR and Contracting Officer for approval, and it is the responsibility of the Contractor to obtain the appropriate signatures. See Section H.2, NFS 1852.216-80, Task Ordering Procedure. The process timeframe for CTO work begins following receipt date (date issued) of the CTO by the COTR, which will be tracked by the electronic date stamp of the electronic (or email) system used. Lack of labor, materials, and all necessary equipment, tools, and transportation shall not be an acceptable cause for unsatisfactory performance or failure to complete IDIQ work. Noncompliance with scheduled completion dates shall be subject to deductions per Section E.6, Inspection and Acceptance; Consequences of Contractor's Failure to Perform Required Services. A sampling of IDIQ work history is shown in Attachment 2.05.04, Section J.
- C7.1.C** Contract Task Order Request (CTOR). A CTOR is a mechanism for the Contractor to identify IDIQ work, which the Government may issue as an official CTO. The Contractor shall prepare a CTOR when identifying IDIQ work, or when the COTR is requesting a detailed cost estimate for work intended to be performed by the Contractor in the future. Both methods are included as part of the firm fixed price portion of the contract. However, resulting work to the Contractor is not guaranteed in either case. CTORs are primarily developed when the Contractor identifies problems and deficiencies noted during the course of performing work on-site and shall be included as part of the Facility Condition Assessment (FCA). The CTOR

shall be provided to the COTR using a standardized format that shall include, but not limited to, unique CTOR number, date, description of the work to be performed, location, historical information including past work order number reference, equipment number, and estimated material, labor, and equipment cost. The CTOR estimate shall be valid for 120 calendar days. If 120 days has passed and no action has been taken, the CTOR can be re-estimated by the Contractor and re-submitted to the Government. If the CTOR results in issuance of an official CTO, the CTO cost shall not exceed ten (10) percent above the CTOR cost estimate previously submitted unless a change of scope is noted.

C7.2 CRAFT HOUR UNIT PRICE (CHUP) WORK

CHUP work is defined as IDIQ work which may exceed the firm fixed price work trouble call (TC) limit, specified in Section C5.2, Firm Fixed Price Work; Trouble Calls, except for repairs or new work that are not classified as TC. The Contractor shall prepare and furnish a cost estimate identifying proposed labor, material, and equipment costs, which, upon approval by the Contracting Officer and COTR, becomes a firm fixed price task order. The need for estimates may result from Contractor inspections, TC exceeding the limit, equipment breakdowns, system malfunctions, new requirements, or from other inspections and requests from the COTR. The Contractor shall prepare either a preliminary cost estimate at their own discretion to be used for planning and budgeting purposes and sent to the COTR for resolution, or a detailed cost estimate for accomplishment of work when requested by the COTR. Labor rates for both regular and off-shift working hours shall be provided.

C7.2.A Subcontracting Rates. The Contractor shall provide subcontractor labor rates for various crafts as listed in the CHUP pricing schedule. A fully burdened baseline subcontractor craft labor rate shall be established and used when specific subcontractor company rates have not been identified. The Contractor shall provide the negotiated labor rates for established subcontracting relationships that include all direct and indirect costs plus profit for both companies. There is no limit to the number of subcontractor company rates the Contractor can provide to the Government, and these rates can be submitted anytime to the Government for inclusion by modification to the contract by the Contracting Officer.

C7.2.B Preliminary Cost Estimate Preparation. The Contractor shall provide a preliminary, "scoping" type cost estimate for each CHUP work job within three (3) working days following verbal or written request by the COTR. The preliminary estimate shall identify summarized labor, material, and rental equipment costs.

C7.2.C Detailed Cost Estimate Preparation. The Contractor shall prepare an independent estimate of the labor, material costs, and equipment required to complete work identified by written request from the COTR using the latest R.S. Means® Company Facilities Maintenance and Repair Cost Data and Methods. If cost data is not available or work requires unique services, quotes from local licensed suppliers and/or contractors shall be used in preparing the cost estimate. Estimates and all supporting information, documentation, and calculations shall be submitted to the COTR within the time requirements stated in Paragraph C7.2.C.1, Cost Estimate Categories. The Contractor shall prepare up to 50 detailed cost estimates per year for work requirements that may not be exercised by the Government. Any requested detailed estimates beyond this limit will be charged at the cost estimating line item CHUP rate not to exceed \$2,500 per the following schedule:

C7.2.C.1 Cost Estimate Category Classification. The Contractor shall prepare a detailed cost estimate that falls into one of three categories listed below in terms of time preparation. The COTR will determine category classification at time of request to be placed on either the CTOR or CTO form. Noncompliance with cost estimate preparation dates shall be subject to deductions per Section E.6, Inspection and Acceptance; Consequences of Contractor's Failure to Perform Required Services. The Contractor

may provide input to the category classification within three (3) working days upon receipt of notice by the COTR. All inputs will be considered by the COTR.

- C7.2.C.1.a Category 1 - Well Defined. A document was sent over to the Contractor with a clear well-defined detailed scope of work. Preparation of the cost estimate will require very little additional information on the part of the Contractor, or repair being performed is clear, concise, and can be performed with only minor modifications. The Contractor shall submit a cost estimate within five (5) calendar days following the COTR's written request or as otherwise specified.
- C7.2.C.1.b Category 2 – Defined But Ambiguous. A document was sent over to the Contractor with a defined scope of work but somewhat ambiguous as to its implementation. Preparation of the cost estimate and further task plan requirements will require additional information on the part of the Contractor, usually in consultation with the requested user and subject expert. Work may entail some simple calculations, modified layout design, upgrades to existing equipment for which new requirements must be met, and reviewing existing systems to determine extent of repairs. The Contractor shall submit a cost estimate within 15 calendar days following the COTR's written request or as otherwise specified.
- C7.2.C.1.c Category 3 - Complex. A document was sent over to the Contractor with a complex scope of work or implementation, meaning the scope intent is known, but preparation of the cost estimate will require significant effort and information on the part of the Contractor, usually in consultation with the requested user(s), COTR, and subject expert(s). Work may entail conceptual design layouts, researching historical drawings and specifications, analyzing existing systems to determine content and deficiencies, and performing engineering calculations to arrive at an estimate. The Contractor shall submit a cost estimate within 45 calendar days following the COTR's written request or as otherwise specified.
- C7.2.C.2 Total Labor Cost Estimate. The total labor cost estimate shall be the sum of the required individual craft times multiplied by the DBA or SCA CHUP from the applicable schedule of IDIQ Work shown in the Pricing Schedule, Item Number 0007, Attachment 1.03, Section J. The Contractor shall use applicable R.S. Means® Company Facilities Maintenance and Repair Cost Data for the local region as the basis for the determination of the craft times listed in the Bid Schedule, approved subcontractor rates, and/or past history. Labor for cost estimating shall be shown as a separate line item if applicable.
- C7.2.C.3 Material Estimate. Applicable R.S. Means® Company Facilities Maintenance and Repair Cost Data for the local region shall be used as a basis for the determination for the material cost and/or past history. Any required individual repair part, material item, or portable equipment item greater than \$1,000 that is not available in Means®, the Contractor should receive and record price quotes from at least two (2) vendors that regularly engage in the supply of the required part or item. The estimated material cost should either be the lower of the two (2) quotes, or if the higher quote is selected, the best value to the Government. The vendor's name and corresponding price quote should be included in the estimate. The material price should be reduced by all discounts and rebates for core value or salvage value that accrue to the Contractor. Minor materials and supplies incidental to the job and any material handling costs should not be included since these costs are included in the CHUP.
- C7.2.C.4 Construction Equipment Estimate. For required construction equipment, the Contractor shall include a detailed price listing, stating size, capacities, quantity, number of units, and unit prices. If rented, the equipment cost should be based on the lowest periodic price available or best value to the Government considering the time constraints of the

job, including applicable operator and rigger personnel, if commercially furnished by the lesser. The vendor's name and price quote should be included in the estimate. If Contractor owned, the equipment cost should be determined using applicable R.S. Means® Company Construction Cost Data for the local region. If the Contractor proposes to use Installation-Provided Equipment (IPE), the equipment cost should be shown as zero as a line item.

C7.2.D Cost Estimate Evaluation and Approval. The Contractor's detailed cost estimate will be evaluated and compared to an independently prepared Government cost estimate to determine if:

C7.2.D.1 The Contractor has clearly and accurately identified the scope.

C7.2.D.2 The craft hours and/or subcontractor rates have been accurately applied.

C7.2.D.3 Equipment and material estimates are reasonable and properly documented.

All estimates prepared by the Contractor for the Government shall be valid for a minimum of 60 days from the submittal date to the COTR. An approved estimate will become firm fixed price for the work described on the CTO signed by the Contracting Officer and COTR. If the Contractor and Government fail to agree on the price for any CHUP work, the Government reserves the right to unilaterally establish the price whereupon Contractor may dispute the action as provided in FAR clause 52.233-1, Disputes - Alternate 1, included in Section I, but the Contractor shall immediately proceed with the ordered work and execute diligently per the specified work statement. The established price by the Government will be based on current prices in the pricing schedules and quotes from local vendors if applicable.

If the Government cancels CTOs which the Contractor expended greater than four (4) hours to prepare the detailed cost estimate, the Government may pay for the preparation time on the CTO before close-out if it falls within the 50 detailed cost estimates per year. The Government will pay for all preparation time on the CTO beyond 50 per year not to exceed \$2500 total cost per order.

If the Contractor fails to accept IDIQ CHUP work and does not negotiate in good faith with the Government, the Government reserves the right to solicit this work from other sources. Furthermore, repeated failure by the Contractor to accept and negotiate IDIQ CHUP work within the scope of this contract may be cause for default of the contract per the FAR clause 52.249-8, Default (Fixed-Price Supply and Service) or 52.249-10, Default (Fixed-Price Construction), in Section I.1.

C7.3 CHANGES TO SCOPE OF WORK

If, during performance of IDIQ work, the Contractor encounters unforeseen conditions that impact the work and could not be evaluated during the initial estimating procedures, the Contractor shall submit to the COTR a proposed change order to the CTO and not proceed without first obtaining authorization from the COTR and Contracting Officer. The proposed change order shall contain adequate information, including any necessary drawings, specifications, and cost breakdowns, for the Government to fully assess the unforeseen condition or current situation. After review of the proposed change order, the Government will either direct the Contractor not to proceed with the work or issue a modification to the CTO for the change in scope as specified on the proposed change order. The Contractor must notify all Facility Service Managers (FSM) and/or customers being affected of any schedule delay as they occur. The Contractor shall not be entitled to any additional compensation for preparing a proposed change order, whether ultimately accepted or not.

C7.4 ACCEPTANCE OF INDEFINITE DELIVERY INDEFINITE QUANTITY WORK

It is the Contractor's responsibility to obtain all required signatures on the CTO form prior to commencement of work. Failure to obtain proper authorization in a timely manner will be subject to payment deductions.

The Contractor shall notify the COTR within one (1) working day following completion of each CTO to schedule a joint final inspection. Generally the Government will schedule the joint final inspection within three (3) working days. The Government will thoroughly inspect and accept IDIQ work only after all work has been completed and noted discrepancies have been corrected. A complete CTO package, including a statement of corrective action taken and revised sketches or drawings (if other than originally provided in the scope of work), construction permit(s) and inspection records, shall be returned to the COTR within three (3) working days following the joint final inspection. It is the Contractor's responsibility to obtain the customer's and COTR's signatures indicating final acceptance of work performed on each CTO. All affected databases shall be updated within ten (10) working days following completion of work. Following final acceptance by the Government, the Contractor shall invoice for payment as specified in the Section G clause, ARC 52.232-90, Submission of Invoices - Fixed Price. Failure to invoice within the stated time period will be subject to payment deductions.

END OF SECTION C7

SECTION C8**ENERGY AND WATER MANAGEMENT****C8.1 GENERAL REQUIREMENTS**

General Intention. The Contractor shall provide all labor, materials, equipment, supervision, and management necessary to comply with the NASA Facilities Maintenance and Operations Management, NPR 8831.2E by using energy efficient equipment and products, record energy and water consumption monthly, read all utility meters, and provide documentation per various public laws, Executive Orders (EOs), and NASA policy directives that require consideration of the impact of maintenance practices on the energy and water consumption of plant equipment at Ames Research Center (ARC) and Moffett Airfield Complex (MAC). NASA must meet energy reduction goals, meter their utilities, and report quarterly to NASA Headquarters. Additionally, the Contractor shall purchase and use energy efficient equipment and products per Paragraph C8.4, Contractor Furnished Items, below.

C8.2 DEFINITIONS

See NASA Facilities Maintenance and Operations Management, NPR 8831.2E, or latest edition.

Energy Efficient Product. A product that meets Department of Energy and Environmental Protection Agency criteria for use of the Energy Star® trademark label, or is in the upper 25 percent of efficiency for all similar products as designated by the Department of Energy's Federal Energy Management Program (FEMP).

EPAct. Energy Policy Act of 2005. A major energy law enacted by Congress and signed by President Bush on August 8, 2005. The EPAct contains establishment of specific conservation guidelines for federal agencies and strategies for execution methods in promoting federal leadership in energy management.

LEED. The Leadership in Energy and Environmental Design Green Building Rating System that encourages and accelerates global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria. LEED is a third-party certification program and the nationally accepted benchmark for the design, construction and operation of high performance green buildings. LEED gives building owners and operators the tools they need to have an immediate and measurable impact on their buildings' performance. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

C8.3 GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES

Refer to Section C3.

C8.4 CONTRACTOR FURNISHED ITEMS

Refer to Section C4.

The Contractor shall ensure that energy-consuming products are energy efficient products (i.e., Energy Star® products or FEMP designated products) throughout the performance period of this contract. This requirement applies to the Contractor unless the energy-consuming product is not listed in the Energy Star® Program or FEMP; no Energy Star® or FEMP designated product is reasonably available that meets the functional requirements of NASA, is cost effective over the life of the product taking energy cost savings into account, or is otherwise approved in writing by the Contracting Officer. Information about these products is available at the following websites:

<http://www.energystar.gov/products>

http://www1.eere.energy.gov/femp/procurement/eep_requirements.html

C8.5 FIXED PRICE WORK

The following contract requirements shall be performed per the Performance Requirements Summary (PRS), Attachment 3, Section J, at the frequency specified within the contract requirement:

C8.5.A Contract Requirement No. C8-501, Monthly Meter Readings.

Code Compliance Standard(s) – Ames Enhanced Use Lease Agreements.

Attachment(s) – 2.08.01, Section J, Meters Inventory

PM Checklists – C8-501, Section J

The Contractor shall read and log monthly meter data for natural gas (housing, building, and total for ARC and MAC); electricity (housing, building, wind tunnel, and total for ARC and MAC); water; and sanitary sewer. All meters that are to be read are listed in Attachment 2.08.01, Section J. All meters are to be read during the first five (5) days of each month. The Contractor shall keep records of all multiplier factors used for each meter.

C8.6 DOCUMENTATION AND REPORTING REQUIREMENTS

C8.6.A Contract Requirement No. C8-601, Meter Reading Monthly Report. The Contractor shall provide one electronic copy to the COTR of a monthly meter reading report for natural gas (housing, building, and total for ARC and MAC); electricity (housing, building, wind tunnel, and total for ARC and MAC); water; and sanitary sewer. A sample format is provided in Attachment 2.08.02, Section J. Report shall be submitted to the COTR by the 12th of each month. If the 12th should fall on a weekend or holiday, the report shall be submitted no later than the first working day after the 15th.

C8.6.B Contract Requirement No. C8-602, Meter Inventory Annual Report. The Contractor shall provide an annual inventory report of all the utility meters on site that covers the utilities for natural gas, water, sanitary sewer, electricity, and propane. Report shall include location with photograph, equipment ID number, manufacturer, size, type, model number, serial number, multiplier number (if any), install date, last calibration date, and what buildings/systems/equipment the meter is servicing. The Contractor shall provide one (1) electronic copy and two (2) legible hard copies of the report to the COTR annually.

C8.6.C Contract Requirement No. C8-603, Fuels Reading Quarterly Report. The Contractor shall provide one electronic copy to the COTR of a quarterly consumption of fuels report (diesel, propane, and motor vehicles assigned to the Contractor by the Government), due 45 calendar days after the end of each Government fiscal year quarter. A sample format is provided in Attachment 2.08.03, Section J.

- C8.6.D Contract Requirement No. C8-604, Energy Quarterly Report. The Contractor shall provide a quarterly energy report, due 45 calendar days after the end of each Government fiscal year quarter to the COTR. A sample format is provided in Attachment 2.08.04, Section J. This information is updated on an internet accessible website.
- C8.6.E Contract Requirement No. C8-605, Energy Annual Report. The Contractor shall provide information to the COTR for an annual energy report that is due 30 calendar days after the end of each Government fiscal year. A sample format is provided in Attachment 2.08.05, Section J. NASA ARC is required to submit this report with data provided by the Contractor. The Contractor shall provide input to the report for items related to project cost savings, future goals and planned savings projects, payback calculations, audits completed, and any relevant training.
- C8.6.F Contract Requirement No. C8-606, Energy and Water Reduction Plan. The Contractor shall submit a plan detailing a program to reduce energy and water consumption in their operations and in building and building systems included in the maintenance programs while maximizing operational efficiency. The plan shall address selected components of the LEED® for Existing Buildings; Operations and Maintenance Green Building Rating System that are directly applicable to energy and water efficiency and material purchases, document successes in implementing energy and water conservation measures, and address challenges toward keeping pace with increasing standards in relation to the EPA Act of 2005. The plan shall be submitted to the COTR 90 calendar days after start of the Base Period and updated annually. The acceptance of the plan is subject to compliance with Government regulations and guidelines.

C8.7 INDEFINITE DELIVERY INDEFINITE QUANTITY WORK

Indefinite delivery indefinite quantity (IDIQ) work will be ordered in accordance with Section C7, Indefinite Delivery Indefinite Quantity Work. The engineering Craft Hour Unit Price (CHUP) rates will apply to all IDIQ services in this section. Typical services ordered by the Government are shown below in this section.

C8.7.A Engineering and Technical Services.

- C8.7.A.1 New Meter Planning and Installation. The Contractor shall be required to provide engineering and technical services for new meter planning and installation. Engineering and technical services for new meter planning and installation shall include all labor and materials for providing the following functions: Meter sizing, product selection, engineering, construction drawings, construction bid package development and preparation. New meters shall be readable remotely by the Facility Management Control System (FMCS) (See Section C11.2, Facility Alarm and Monitoring Systems Maintenance and Repair; Definitions) unless conditions determined by the Government make it unnecessary. In those cases, meters shall have local accumulation of data and local display of readings.
- C8.7.A.2 New Water Conservation Technologies. The Contractor shall be required to provide engineering and technical services for demonstration projects of new water conservation technologies. Engineering and technical services for demonstration projects shall include all labor and materials for providing the following functions: Engineering, product/equipment sizing and selection, construction drawings, construction bid package development and preparation.
- C8.7.A.3 Energy Audits, Studies, and Energy Conservation Projects. The Contractor shall be required to provide engineering and technical services for energy audits, studies, and energy conservation projects. Engineering and technical services shall include all labor and materials for performing Comprehensive Energy Audits as defined by EO 12902.

The term "Comprehensive Energy Audit" means a survey of a building or facility that provides sufficiently detailed information to allow an agency to enter into energy or water savings performance contracts, or to invite inspection and bids by private upgrade specialists for direct agency-funded energy or water efficiency investments. The Contractor shall prepare a written report. It shall include information such as the following: a) The type, size, energy use, and performance of the major energy using systems and their interaction with the building envelope, the climate and weather influences, usage patterns, and related environmental concerns; (b) appropriate energy and water conservation maintenance and operating procedures; (c) recommendations for the acquisition and installation of energy conservation measures, including solar and other renewable energy and water conservation measures and use of reclaimed water; and, (d) a strategy to implement the recommendations.

Engineering and technical services for energy and water conservation projects shall include all labor and materials for providing the following functions: Engineering, investigations and documentation to resolve issues regarding energy and water conserving systems installed, product/equipment sizing and selection, construction drawings, construction bid package development and preparation.

C8.7.B Digital Energy Monitoring Systems (DEMS). The Contractor shall provide and install as a replacement or new DEMS per the Contract Task Order (CTO). The Contractor shall use the latest models of the Siemens electrical Digital Energy Monitors series 1000 and 2000, or approved equal.

C8.7.B.1 Replacement: The Contractor shall remove the existing units and install new DEMS units at specified locations per the CTO.

C8.7.B.2 New: The Contractor shall install new DEMS units at specified locations per the CTO order.

C8.8 DETAILED SPECIFICATIONS

C8.8.A Energy Conservation. The Contractor shall actively participate in the ARC Energy Conservation Program and comply with the NASA Energy Conservation Program. In addition, the Contractor shall become familiar with NASA Facilities Maintenance and Operations Management (NPR 8831.2E, latest edition). Use of high-energy consuming tools, lighting fixtures, or equipment shall be minimized as much as possible by using the most efficient technology available that fully meets the requirements of the application.

C8.8.A.1 Energy Savings Performance Contract. The Government has entered into a long-term energy savings performance contract agreement with Johnson Controls, Inc. for energy savings at Ames Research Center. The Contractor shall maintain all Government energy saving devices identified in this agreement. See Attachment 2.08.06, Section J, for details concerning what items are covered under this agreement.

C8.8.B Energy Saving Lighting Systems. The Contractor shall replace all lighting systems requiring replacement under this contract with energy saving lighting systems complying with California Code of Regulation Title 20 and 24. Replacement lighting systems in office spaces shall provide between 60 to 70 foot candles at 30 inches above the floor. Replacement lighting systems in corridor spaces shall provide between 20 to 30 foot candles at 30 inches above the floor.

C8.8.C Water Conservation. The Contractor shall reduce water consumption to the extent practicable. Reduction activities can include but are not limited to installing low flow fixtures and appliances, planting drought-tolerant native plant species, increasing landscaped mulched areas to decrease evaporation rates, placement of outdoor shade components,

structures, or plants, eliminating over-watering of lawns and other landscaped areas, and fixing broken sprinklers and water mains in an expedient manner. Water conservation measures shall be addressed in the annual water reduction plan.

END OF SECTION C8

SECTION C9**ROADS AND OTHER SURFACED AREAS MAINTENANCE AND REPAIR****C9.1 GENERAL REQUIREMENTS**

General Intention. The Contractor shall provide pavement sweeping and temporary and permanent patching of sections of flexible and rigid pavement to support maintenance services at Ames Research Center (ARC), Moffett Airfield Complex (MAC), and Moffett Housing Annex (MHA) Area 2. The Contractor shall also be responsible for the maintenance of signs (street, traffic, building, handicap, etc.) guardrails, gutters, curbs, ramps, sidewalks, pads, and wheel blocks. All work shall comply with the Americans With Disabilities Act (ADA) specifications.

C9.2 DEFINITIONS

Refer to Section C2.

C9.3 GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES

Refer to Section C3.

C9.4 CONTRACTOR FURNISHED ITEMS

Refer to Section C4.

C9.5 FIXED PRICE WORK

The following contract requirements shall be performed per the Performance Requirements Summary (PRS), Attachment 3, Section J, and the performance criteria listed within the contract requirement:

C9.5.A Trouble Calls (TC). The Contractor shall perform all TC related to this section per Section C5.2, Firm Fixed Price Work; Trouble Calls. Work shall include, but not limited to, repair and/or replacement of signs (street, traffic, building, handicap, etc.) guardrails, gutters, curbs, ramps, sidewalks, pads, and wheel blocks.

C9.5.B Contract Requirement No. C9-501, Surfaced Areas Sweeping: Streets.

Code Compliance Standard(s) – Storm Water Environmental Compliance

Attachment(s) – 2.09.03, Section J, Sweeping Maintenance PM History; 2.09.04, Section J, Pavement Sweeping Maintenance Map; 2.12.01, Section J, Pavement (Surfaced Area) Inventory

PM Checklists – C9-501, Section J.

The Contractor shall maintain all streets at ARC, MAC, and MHA2 free of all debris to the curb or shoulder of the roadway. Debris shall be removed by regenerative air power street sweeping equipment, and other equipment required to provide a clean sweep. All street sweeping shall be performed after regular working hours to minimize any disruption to the resident working population, and barricades shall be used to restrict traffic, if necessary, with authorization from the Government. Debris shall not be swept into storm drains, nor left in

piles. All swept materials shall be dumped in an authorized container and removed from Government property. See Attachment 2.12.01, Section J, for pavement (surfaced area) inventory, and Attachment 2.09.03 and 2.09.04, Section J, for current sweeping maintenance PM history.

C9.5.C Contract Requirement No. C9-502, Surfacd Areas Sweeping: Parking Lots.

Code Compliance Standard(s) – Storm Water Environmental Compliance

Attachment(s) – 2.09.03, Section J, Sweeping Maintenance PM History; 2.09.04, Section J, Pavement Sweeping Maintenance Map; 2.12.01, Section J, Pavement (Surfaced Area) Inventory

PM Checklists – C9-502, Section J.

The Contractor shall sweep all parking lots and other areas as identified to eliminate standing dirt and obstacles, expose all painted markings and designations, and remove all hazards to foot traffic. Debris shall be removed using regenerative air power street sweeping equipment, hand blowers (restricted use on Spare The Air Day(s)), vacuums, and hand brooms as required to sweep lots clean. All lots shall be swept after regular working hours, and shall be barricaded to restrict parking and traffic during the sweeping operation, if necessary, with authorization from the Government. Debris shall not be swept into storm drains nor left in piles. All swept materials shall be dumped in an authorized container and removed from Government property. See Attachment 2.12.01, Section J, for parking lot surfaces in the surfaced areas inventory, and Attachment 2.09.03 and 2.09.04, Section J, for current sweeping maintenance PM history.

C9.5.D Contract Requirement No. C9-503, Pavement Assessment.

Code Compliance Standard(s) – Metropolitan Transportation Commission (MTC)

Attachment(s) – 2.09.05, Section J, Pavement Assessment Report (Sample)

PM Checklists – C9-503, Section J.

The Contractor shall assess the condition of all paved surfaces located at ARC and MAC. Paved surfaces include roadways, sidewalks, and parking lots. The Contractor shall assess the surface and subsurface condition for age of pavement, any historical events related to the pavement, conditions that will imminently develop into potholes, sunken asphalt in need of patching, obstacles that preclude driving safely, large cracks (1/2 inch or greater) in need of filling, deteriorated expansion joints, spalled or broken concrete surfaces, faded road and parking lot markings, displaced wheel blocks in need of replacement and/or repining, missing, faded, or damaged signage, etc. Information shall be input into the MTC Pavement Management System program to document pavement problems and predict future condition of pavements at different funding levels, help assess and diagnose necessary repairs, and assist in planning for judicious maintenance in the future.

C9.6 **DOCUMENTATION AND REPORTING REQUIREMENTS**

C9.6.A Contract Requirement No. C9-601, Pavement Assessment and Repair Plan. The Contractor shall submit an annual pavement assessment and repair plan to the COTR for all paved surfaces located on Moffett Field, excluding U.S. Army housing annexes. The report shall contain the current assessment of the surface and subsurface condition for age of pavement, any historical events related to the pavement, conditions that will imminently develop into potholes, sunken asphalt in need of patching, raised surfaces in need of repairs, other obstacles to driving and pedestrian safety, large cracks (1/2 inch or greater) in need of filling, deteriorated expansion joints, spalled, broken, and uneven concrete surfaces that present safety hazards including sidewalks, faded road and parking lot markings, displaced wheel blocks in need of replacement and/or repining, missing, faded, or damaged traffic and pedestrian signage, etc. This plan shall complement the Annual Facility Condition

Assessment required under Section C13.6.B, Buildings and Structures Maintenance, Repairs and Alterations; Documentation and Reporting Requirements; Contract Requirement No. C13-602, Facility Condition Assessment Report. Report all distress data per road section inventory, and supply pavement condition index calculations and develop budget scenarios for various maintenance strategies. The MTC Pavement Management System Program output shall be submitted to the COTR as part of this requirement along with a report on sidewalk, parking areas, and signage conditions. Its purpose is to help plan and manage road, parking, and pedestrian improvement projects, document budget needs and shortfalls, and use the collected data to build support for additional funding. A sample MTC output format is shown in Attachment 02.09.05, Section J, Pavement Assessment Report.

C9.7 INDEFINITE DELIVERY INDEFINITE QUANTITY WORK

Indefinite delivery indefinite quantity (IDIQ) work will be ordered in accordance with Section C7, Indefinite Delivery Indefinite Quantity Work, and completed within the number of calendar days specified in the Contract Task Order (CTO). The Craft Hour Unit Price (CHUP) rates will apply to all IDIQ services in this section. Typical services ordered by the Government are shown below in this section.

C9.7.A Pavement Crack Sealing. The Contractor shall seal cracks and joints 1/8-inch or wider in surfaced areas. The Contractor shall clean out specified locations with mechanical routing and compressed air to remove debris and loose particles, and seal with sealant under dry conditions.

C9.7.A.1 Slurry Sealing. The Contractor shall apply slurry seals to extend the life of existing pavement by protecting it from oxidation and deterioration. Type I slurry seal is generally used on parking lot areas and runway applications. Type II slurry seal is coarser material commonly used where moderate to heavy traffic is found. Slurry Seal shall consist of mixing asphalt emulsion, aggregate, and water and spreading the mixture on a surface or pavement where shown on the plans, as specified. Aggregate shall consist of sound, durable, crushed stone or crushed gravel and approved mineral filler. The material shall be free from vegetable matter and other deleterious substances. Aggregates shall be 100% crushed with no rounded particles, volcanic in origin, and black in color. Water shall be potable, free of harmful soluble salts and shall be of such quality that the asphalt will not separate from the emulsion before the slurry seal is in place.

C9.7.B Temporary Pavement Patching. The Contractor shall temporarily patch potholes and depressions in bituminous and concrete pavements at specified locations with bituminous cold mix or hot mix. The area to be patched shall be cleaned out of any loose material or soil, leveled, filled under dry conditions with bituminous material, and compacted using a hand tamp and/or weighted roller. The final compacted surface of the patched area shall be approximately level with the adjacent pavement surface.

C9.7.C Bituminous Pavement Patching. Permanent patching of an area requires proper preparation and backfill. Replacement material shall be of equal or greater quality than the existing, and shall equal the existing material in thickness including all existing overlays up to six (6) inches maximum. Prior to beginning of patching operations, the Contractor shall submit a job mix formula to the COTR for approval, using procedures outlined in Asphalt Institute Specification AI MS-2. The Contractor shall perform the following steps when permanently patching depressed and/or deteriorated areas or potholes in bituminous pavement at specified locations:

C9.7.C.1 Square up and deepen the area or pothole. The sides of the hole shall be cut vertical and square, with a concrete saw, perpendicular and parallel to the direction of traffic.

- C9.7.C.2 Remove all existing loose material down to firm support, a maximum depth of six (6) inches.
- C9.7.C.3 Apply a tack coat to bond the new bituminous material to the bottom and sides using liquid asphalt (emulsified: SS-1, SS-1h, CSS-1, or CSS-1h; or cutback: RC-250 or RC-70) at the rate of 0.3 gallons per square yard.
- C9.7.C.4 Backfill the prepared area with bituminous hot mix. This material shall be carefully placed, preventing separation of the mixture, in layers not to exceed four (4) inches and compacted to 95 percent of the maximum laboratory density of the material used. The completed patched area shall match the grade and elevation of the adjacent sound pavement.
- C9.7.D Concrete Pavement Patching. The Contractor shall perform the following steps when permanently patching broken, depressed, and deteriorated sections in concrete pavements at specified locations:
- C9.7.D.1 Concrete patches consist of shallow and deep patches. For shallow patches, the Contractor shall remove broken or deteriorated concrete from the surface down to sound concrete, a maximum of three (3) inches deep. The edges shall be squared and the sides cut vertically using a concrete saw. For deep patches, remove the broken, depressed, or deteriorated concrete down to the base material, beginning at least six (6) inches outside each end of the broken, depressed, or deteriorated area.
- C9.7.D.2 Prior to placement of new concrete, remove all existing dust, loose concrete, and debris from the area to be patched. For shallow patches, the area shall be primed with a cement or epoxy grout. For deep patches, the vertical surfaces and the base material shall be moistened with water. If forms are used, they shall be securely installed, oiled, and moistened with water.
- C9.7.D.3 Place new concrete in the areas to be patched at an air temperature exceeding 40°F and tamp or vibrate and screed off at a slightly higher level than the adjacent finished surface. Air-entrained Portland cement concrete, that has been properly proportioned and mixed in order to provide a minimum compressive strength of 3,000 pounds per square inch when tested at 28 days, shall be used for all concrete pavement patching. Strike tooled joints, especially at all interior angles, and install fibrous bituminous expansion joint material, where applicable, to match existing joints in adjacent pavements.
- C9.7.D.4 After placing the new concrete, finish by floating and finishing in order to provide a surface texture that matches the existing adjacent pavement.
- C9.7.D.5 Immediately after completion of finishing operations, the new concrete shall be covered and kept damp or a membrane-curing compound applied to prevent loss of moisture during the curing period. The curing shall be applied as soon as the newly patched surface is hard enough to resist marking and shall remain in place for seven (7) days.
- C9.7.E Asphalt Overlay. An overlay is applied when the existing asphalt is in overall good condition but may have some problem areas. Depending on the degree of cracking, crumbling or sunken areas, those areas can be cut out, patched, and then a new layer can be paved over the top. Proper installation of an overlay must include saw cut butt joints. Asphalt should never be "tapered down" to meet any other surface. Prior to paving an overlay, a tac coat primer should be used.
- C9.7.F Roadway Striping. The Contractor shall perform the following when striping roadways:

- C9.7.F.1 Reflective Paint. Furnish and apply white or yellow reflectorized roadway traffic striping at specified locations, four (4) inches in width. Apply reflective paint per Paragraph C9.8.A, Pavement Marking.
- C9.7.F.2 Thermoplastic Application. Furnish and apply white or yellow reflectorized roadway traffic striping at specified locations, four (4) inches in width. Apply thermoplastic material per Paragraph C9.8.A, Pavement Marking.
- C9.7.G Parking Lot Striping. Furnish and apply white non-reflectorized parking lot striping at specified locations, four (4) inches in width, per Paragraph C9.8.A, Pavement Marking.
- C9.7.H Pavement Crosswalks Striping. The Contractor shall perform the following when striping for crosswalks:
- C9.7.H.1 Reflective Paint. Furnish and apply white reflectorized pavement pedestrian crosswalks perpendicular to traffic at specified locations, having rung and rail lines six (6) inches in width, rung lengths of five (5) feet spaced 16 inches apart, and rail lengths extending the full width of the pavement section being crossed. Apply reflective paint per Paragraph C9.8.A, Pavement Marking.
- C9.7.H.2 Thermoplastic Application. Furnish and apply white reflectorized pavement pedestrian crosswalks perpendicular to traffic at specified locations, having rung and rail lines six (6) inches in width, rung lengths of five (5) feet spaced 16 inches apart, and rail lengths extending the full width of the pavement section being crossed. Apply thermoplastic material per Paragraph C9.8.A, Pavement Marking.
- C9.7.J Pavement Stop Bars. The Contractor shall perform the following for pavement stop bars:
- C9.7.J.1 Reflective Paint. Furnish and apply white reflectorized pavement stop bars at specified locations, 12 inches in width extending the full width of, and perpendicular to, the traffic lane. Apply reflective paint per Paragraph C9.8.A, Pavement Marking. When used in conjunction with a stop sign, the stop bar shall be applied in line with the stop sign unless otherwise requested by the COTR.
- C9.7.J.2 Thermoplastic Application. Furnish and apply white reflectorized pavement stop bars at specified locations, 12 inches in width extending the full width of, and perpendicular to, the traffic lane. Apply thermoplastic material per Paragraph C9.8.A, Pavement Marking. When used in conjunction with a stop sign, the stop bar shall be applied in line with the stop sign unless otherwise requested by the COTR.
- C9.7.K Traffic Letters and Numbers. Furnish and apply white non-reflectorized pavement traffic numbers and letters at specified locations per Paragraph C9.8.A, Pavement Marking. Pavement word and symbol markings shall conform to the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD), latest edition.
- C9.7.L Handicap Symbols. Furnish and apply blue non-reflectorized pavement handicap symbols at specified locations, having dimensions as shown in Attachment 2.09.02, Section J, per Paragraph C9.8.A, Pavement Marking.
- C9.7.M Parking Stall Letters. Provide markings as specified:
- C9.7.M.1 Curb. Furnish and apply white non-reflectorized parking stall letters at specified locations, 4-inches in height with a 1-inch letter stem thickness, per Paragraph C9.8.A, Pavement Marking.

- C9.7.M.2 Pavement. Furnish and apply white non-reflectorized parking stall letters at specified locations, 8-inches in height with a 1-inch letter stem thickness, per Paragraph C9.8.A, Pavement Marking.
- C9.7.N Wheel Blocks or Parking Bumpers. The Contractor shall install new wheel blocks or parking bumpers as required. Replacement materials shall be of equal or greater quality than the existing. Bumpers shall be reinforced pre-cast concrete, installed in accordance with the recommendations of the manufacturer using steel rods driven into the asphalt pavement and subgrade, or glued with an acceptable concrete adhesive to concrete surfaces.
- C9.7.P Street and Parking Lot Sweeping. The Contractor shall sweep designated streets and parking lot areas beyond the regular fixed price work to a clean state, especially free of accumulated bird droppings and other foreign debris. Sweepers with non-metallic brushes, vacuum cleaners, and hand brooms may be used to provide a clean sweep. Debris accumulating between parking stops shall be blown or swept out to leave a clean state after sweeping. Debris shall not be swept into storm drains nor left in piles. All swept materials shall be removed from Government property.

C9.8 DETAILED SPECIFICATIONS

C9.8.A Pavement Marking.

- C9.8.A.1 Materials and Equipment. Paints for roads and streets shall conform to Federal Specification TT-P-1952, color as specified. Reflective paint shall conform to Federal Specification TT-B-1325, Type I, Gradation A for roads and streets. All paint shall comply with the rules and regulations of the Bay Area Air Quality Management District (BAAQMD), specifically Regulation 8, Organic Compounds, as amended. The Contractor shall provide written certification to the COTR from the paint and reflective media manufacturer prior to use stating that the materials meet these specifications. Paint applicators shall be of the size and type suitable for the particular work.

C9.8.A.2 Application.

- C9.8.A.2.a Surface Preparation. Thoroughly clean surfaces to be marked before application of the paint. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods, as required. Remove rubber deposits, existing paint markings, residual curing compounds, and other coatings adhering to the pavement by water blasting. Scrub affected areas where oil or grease is present with several applications of trisodium phosphate solution, other approved detergent, or degreaser, and rinse thoroughly after each application. To prevent bleeding through the new paint, clean oil-soaked areas and seal with a shellac or primer recommended by the manufacturer. Painting shall not commence in any area until the pavement surface is clean and dry.

- C9.8.A.2.b Painting. Apply paint pneumatically at rates of coverage specified herein. Provide guidelines and templates as necessary to control paint application. Manually paint numbers and letters. Sharply outline all edges of markings. The maximum drying time requirements of the paint specifications shall be strictly enforced to prevent undue softening of bitumen and pickup, displacement, or discoloration by tires of vehicular traffic. Discontinue painting operations if there is a deficiency in drying of the markings until cause of the slow drying is determined and corrected.

- C9.8.A.2.b(1) Reflective Marking Rates. Apply paint evenly to the pavement area to be coated at a rate of 105 (plus or minus 5) square feet per gallon. Apply

glass spheres uniformly to the wet paint on road and street pavements at a rate of six (plus or minus 0.5) pounds of glass spheres per gallon of paint.

- C9.8.A.2.b(2) Non-reflective Marking Rates. Apply paint evenly to the pavement surface to be coated at a rate of 105 (plus or minus 5) square feet per gallon of paint.
- C9.8.A.3 Thermoplastic Material.
- C9.8.A.4 Reflective Media. Alternate forms of reflective media may be used in some applications as approved by the Government. Examples include use of Bot Dots, reflective markers and tape, surface lighting, etc.
- C9.8.B Debris Disposal. The Contractor shall be in compliance with Section C20, Environmental and Emergency Support Services, for disposal of debris resulting from drainage system cleaning, pavement cutting, and patching. Debris shall not be swept into storm drains nor left in piles. All other debris shall be disposed off of Government property.
- C9.8.C Road Surface Repair. Resurfacing, "overlaying" of pavements, is not included in fixed price portion of this contract. Repair of large sections of bituminous and concrete pavements, requiring replacement due to excavation and repair of collapsed sections of underground pipes, culverts, or other structures, will be ordered as Craft Hour Unit Price (CHUP) work per Section C7.3, Indefinite Delivery Indefinite Quantity Work; CHUP Work.
- C9.8.D Portland Cement Concrete.
- C9.8.D.1 Concrete Curb and Gutter. Areas designated for new curb and gutter shall be properly prepared in accordance with the applicable specifications and replacement materials shall be of equal or better quality than the existing. The Contractor shall ensure that: Edges are taken from an existing joint or saw-cut vertical; the subgrade conforms to American Concrete Institute (ACI) standards; when placing new concrete, the air temperature is at least 40 degrees F.; air-entrained Portland cement concrete with a minimum compressive strength of 3,000 psi at 28 days and a maximum slump of four (4) inches is used; reinforcing steel is in accordance with ACI SP-66 and ACI 318-99/318R-99; concrete is placed using single-course monolithic construction; concrete is finished by floating and brooming to match the existing adjacent concrete, with a uniform texture free of waves and irregularities, true to line and grade and with no variations greater than 1/8-inch under a 10-foot straightedge; edges of the gutter, back top edges of curbs, and joints are rounded to a radius of 1/4-inch; joints and edges are tooled and fibrous bituminous expansion joint material installed to match existing joints in adjacent pavements in accordance with ACI 325.9R-91; and fresh concrete is protected from premature drying and excessive hot or cold temperature during the curing period in accordance with the applicable specifications.
- C9.8.D.2 Concrete Sidewalk. Areas designated for new sidewalk shall be properly prepared in accordance with the applicable specifications and ACI guidance. Replacement materials shall be of equal or greater quality than the existing. The Contractor shall ensure that: edges are taken from an existing joint or saw-cut vertical; the subgrade conforms to ACI standards and to the applicable specifications; when placing new concrete, the air temperature is at least 40 degrees F.; air-entrained Portland cement concrete with a minimum compressive strength of 3,000 psi at 28 days and a maximum slump of four (4) inches is used; reinforcing steel is in accordance with ACI SP-66 and ACI 318-99/318R-99; concrete is placed using single-course monolithic construction; concrete is finished by floating and brooming to match the existing adjacent concrete, with a uniform texture free of waves and irregularities, true to line and grade and with no variations greater than 1/8-inch under a 10-foot straightedge; joints and edges are tooled and fibrous bituminous expansion joint material installed to match existing joints

in adjacent pavements in accordance with ACI 325.9R-91; and fresh concrete is protected from premature drying and excessive hot or cold temperature during the curing period in accordance with the applicable specifications.

- C9.8.D.3 Concrete Slabs. The replacement of existing or construction of new concrete slabs, such as for dumpster pads, handicap ramps, stoops and patios, flooring, require proper preparation and conformance to acceptable standards. Replacement materials shall be of equal or greater quality than the existing. Subgrade and concrete material thickness shall be in conformance with applicable standards for the maximum anticipated wheel loads. Additionally, the Contractor shall ensure that: Edges are taken from an existing joint or saw-cut vertical; the subgrade conforms to ACI standards and to the applicable specifications; when placing new concrete, the air temperature is at least 40 degrees F.; air-entrained Portland cement concrete with a minimum compressive strength of 3,000 psi at 28 days and a maximum slump of four (4) inches is used; reinforcing steel and dowels for tying in with existing structures is in accordance with ACI SP-66 and ACI 318-99/318R-99; concrete is finished by floating and brooming to match the existing adjacent concrete, with a uniform texture free of waves and irregularities, true to line and grade and with no variations greater than 1/8-inch under a 10-foot straightedge; joints and edges are tooled and fibrous bituminous expansion joint material installed to match existing joints in adjacent pavements in accordance with ACI 325.9R-91; and fresh concrete is protected from premature drying and excessive hot or cold temperature during the curing period in accordance with the applicable specifications.
- C9.8.D.4 Sealing Concrete Joints and Cracks. The Contractor shall seal joints and cracks in accordance with the concrete sealant manufacturer's instructions and the applicable specifications, including the removal of all existing sealant; re-facing, rebuilding, and cleaning joints; crack preparation and cleaning; and the application and curing of sealant. Sealant material shall be a single-component, cold-applied, self-leveling silicone or hot-poured, self-leveling rubberized asphalt formulated for sealing cracks in concrete surfaces including roadways.

END OF SECTION C9

SECTION C10**GROUND MAINTENANCE AND PEST CONTROL SERVICES****C10.1 GENERAL REQUIREMENTS**

- C10.1.A General Intention. The Contractor shall provide all labor, supervision, materials, tools, equipment, transportation, and management necessary to provide grounds maintenance and pest control services to parcels at Ames Research Center (ARC), Moffett Airfield Complex (MAC), and Moffett Housing Annex (MHA) Area 2 as described in Attachments 2.10.01 through 2.10.14, Section J. The grounds maintenance work shall include, but not be limited to, maintaining landscape in a healthy and vigorous condition by the cutting and incidental trimming of grass turf areas of generally flat terrain, watering, shrub pruning, plant bed cultivation and mulching, tree pruning, tree removal, shrub and tree establishment, grassing, soil test sampling, fertilization, liming, edging, weed abatement, and landscape pest control. Pest Control Services shall be provided for a variety of insects, arthropods, invertebrates, and animals which includes but not limited to the following; wasps, ticks, hornets, termites, bees, yellow jackets, roaches, mosquitoes, caterpillars, spiders, ants, fleas, earwigs, silverfish, moles, mice, rats, ground squirrels, and reptiles. The Contractor shall mitigate all pests and natural enemies located in and around all ARC and designated MAC facilities and buildings according to the Integrated Pest Management (IPM) Plan. Pest Control Services may be required at anytime throughout ARC and MAC (except the golf course and CANG areas shown in Attachment 2.10.12, Section J), and includes the external and interior of said facilities and buildings plus MHA Area 2 excluding MHA interior building structures. Interior coverage area is within five (5) feet of all facility and building footprints or as required to trace back to the pest home population. Work shall be performed per Section C5.2, Firm Fixed Price Work; Trouble Calls, Section C5.3, Firm Fixed Price Work with Paragraph C10.1.B exception below; Recurring Services, and Section C7, Indefinite Delivery Indefinite Quantity Work. All work shall comply with the appropriate directives, instructions, policies, and regulations listed in Attachment 2.06.01, Section J.
- C10.1.B TC Definition and Limitations (This Section Only). For grounds maintenance and pest control services, this paragraph supersedes Section C5.2.A, Firm Fixed Price Work; Trouble Calls; Definition and Limitations. TC is defined as an unscheduled request for work of a one-time nature typically issued to correct, repair, or restore a minor grounds maintenance or pest control problem, requiring little detailed management control, and which is not projected to exceed either twelve (12) work hours or \$750 in total labor and material cost as determined by R.S. Means® standards (hereafter referred to as the "limit"). To gauge the scope and skills required for TC work, the TC historical workload data is shown in Attachment 2.05.03, Section J, and a listing of actual trouble calls is contained in Attachment 2.05.05, Section J. The responsibility to perform work under a single TC ends when the Contractor notifies the COTR that the work is estimated to exceed the TC limit specified after physically exposing and visually inspecting the problem area. Adequate justification shall be provided in writing demonstrating why the Contractor is unable to complete the work within the TC limit. The Government reserves the right to reject the justification if it is determined unacceptable. Any effort expended and costs incurred by the Contractor prior to such notification is considered part of the original fixed price TC and will not be applied toward any Indefinite Delivery Indefinite Quantity (IDIQ) work which may result. For critical and urgent call limits, see Paragraphs C5.2.C.1 and C5.2.C.2.
- C10.1.C Maps. Landscape area location, tree inventory location, shrub and plant bed location, irrigation control system location, and burrowing owl location maps are shown in Attachments 2.10.02, 2.10.04, 2.10.06, 2.10.08, and 2.10.11, Section J. The Contractor shall check all maps furnished or made available to them and shall promptly notify the COTR of any discrepancies or changes as they occur throughout the performance period. The Contractor shall compare all maps and field verify the maintenance areas and contract quantities before

laying out the work and shall be responsible for any errors which may have been avoided otherwise.

C10.1.D Damage Liability. Grassed areas, shrubs and trees which are damaged or killed, sprinkler heads, windows, paved surfaces, or any work items in this contract which are damaged as a result of the Contractor's work shall be repaired or replaced by the Contractor at no additional cost to the Government. The Contractor is also responsible for all damage to private property (e.g. employee or other vehicles), and for any bodily injury resulting from the activities performed under this section.

C10.1.E Standards. The Contractor shall follow all ANSI, OSHA, and environmental standards for safety and environmental protection. Standards shall include ANSI A14.1, A14.2, A14.5, A92.2, A300, B30.5, B71.1, B71.3, B71.4, B71.6, B71.8, B175.1, B175.2, B175.3, Z41, Z87.1, Z89.1, Z133.1, Z308.1, Z359.1, 29 CFR 1910, CCR Title 3, 8, 17, 19, 26, and 27.

C10.2 DEFINITIONS

Aeration. The addition of air into the soil by mechanical means (aeration equipment, plugging) or by the introduction of materials such as sand or peat moss.

Alkaline. Soil or water condition characterized by a high pH.

Annual. A plant that completes its life cycle in a single growing season. Some perennials (*i.e.* flowers) are treated as annuals.

Biennial. A type of plant that completes its life cycle in two (2) years.

Bolt. Annual plants which grow too quickly to flowering stage at the expense of good overall development.

Broadcast. Method of scattering seed by hand over prepared or unprepared soil surfaces.

Broad-leafed Weeds. Any weed which is not a grass.

Canopy. The uppermost layer of vegetation, consisting of the top foliage of trees forming a kind of ceiling.

Certified Arborist. An Arborist certified as competent by organizations such as the Western Chapter of the International Society of Arboriculture (ISA) or National Arborist Association (NAA).

Chlorosis. A condition under which plant leaves turn yellow or white, especially between veins, resulting from lack of iron and chlorophyll. Use of iron chelates can correct this condition.

Common Area. A designated area of land not assigned to any one (1) tenant (occupant) for the purpose of performing grounds maintenance services.

Compaction. A condition of soil in which all air is driven out and water cannot move through the soil.

Complete Fertilizer. A fertilizer containing nitrogen, phosphorus, and potassium, the three (3) most critical plant nutrients.

Conditioning. Preparation of soil to make it suitable for plants.

Conifer. Plants referred to as evergreens whose leaves are narrow, needle-like, or tiny and scale-like. Not all conifers are evergreens. All conifers bear seeds in cones.

Crown. The point where plant roots and aboveground parts meet.

Cultivation. Manual or mechanical loosening of compacted mulch and soil in plant beds to enhance appearance, promote healthy plant growth, and remove undesirable vegetation and other debris.

Debris. Items that have been discarded, unwanted material, fallen leaves and branches, or foreign objects that are undesirable to the landscaped areas.

Deciduous. Type of plant that loses its leaves annually.

Defoliation. This is the unnatural loss of a plant's leaves, usually to the detriment of the plant's health. Some causes are high wind conditions, high heat, drought, frosts, or damage by chemicals, insects, or diseases.

Diameter at Breast Height (DBH). The standard method for measuring tree diameters, measured at a point 4-1/2 feet above ground level. Size is one of the factors used by tree and landscape appraisers in determining a tree's worth or value. Other factors include species, condition, and location.

Dormancy. Period of rest for perennial plants during the cold season where there is little or no growth.

Drainage. Related to plants, this is the process of water passing through the root area of soil.

Drip Line. A circular line around a tree described by its outermost foliage. The term is used in connection with watering and feeding.

Edging. Creating, by mechanical means, a 1/2 inch wide and one (1) inch deep clear zone immediately adjacent to solid surfaces including sidewalks, driveways, street edges, curbs, and other paved areas.

Equipment Guard. Safety guards which protect equipment operators and nearby persons or property from harm or damage resulting from thrown objects. Guards can be rigid guards, flexible flaps, or chains.

Erosion. The gradual wearing away of rock or soil caused by wind, water, or ice.

Evergreen. A type of tree or shrub that retains its foliage during the winter. There are needled types (conifers) and broadleaf forms of evergreen.

Fertilization. The addition of nutrients to soils surrounding plants.

Fertilizer Analysis. The percentage of nutrients, nitrogen, phosphoric acid, and water-soluble potash (in that order) found in a fertilizer product.

Flail Mowing. Process of thinning or de-thatching lawn turf, especially useful and necessary in coarse grass types such as Kikuyu grass.

Foliage. The mass of a plant's leaves, flowers, fruit, and branches.

Girdling. Term used to describe several conditions: (1) the removal of a strip of bark going completely around a plant's main stem, resulting in a situation where nutrients can't move

between the plant's roots and leaves and leads to eventual death; (2) a circular wrapping of roots around a plant's trunk, often the result of being root bound, which may eventually choke a plant; and (3) the choking of a branch by a rope, tie, or wire.

Grading. Changing the form of the land, or the general slope of an area, is important to consider for water management to ensure proper drainage or to eliminate run-off and waste.

Grass Cutting. The cutting and trimming within a designated area of all grasses, weeds, and other vegetation which are of one (1) inch or less in diameter (at ground level).

Grass Seed Blend. A combination of two (2) or more, cultivated varieties of a single species of grass.

Grass Seed Mixture. A combination of two (2) or more, different species of grass.

Ground Cover. A low-growing, spreading plant, usually 18 inches or less in height.

Grounds Structures. Grounds structures include but are not limited to bridges, drainage culverts, drainage systems, retaining walls, guard railings, signs, posts, benches, planters, waste receptacles and enclosures, fencing, gates, and athletic field equipment.

Heading Back. A pruning technique which shortens a branch without totally removing it.

Herbaceous. A type of plant that is woody, having no bark.

Herbicide. A chemical used to kill weeds and unwanted plants.

Integrated Pest Management (IPM). An integrated approach to managing a site's pest population through an organized system involving cooperation of a site's human population. It utilizes regular monitoring to determine if and when treatments are needed, and to evaluate the effectiveness of the treatments applied. IPM employs a mix of physical, mechanical, biological, educational, and least toxic chemical strategies and tactics to keep pest numbers low enough to prevent intolerable damage or annoyance. The emphasis is on long-term suppression through improved sanitation, building repairs, occupant education, and pest-proofing methods that reduce pest access to food, water, harborage, or entrance to buildings.

Irrigation. Supplying water to plants through artificial means.

Jump-Cut. Pruning technique for the removal of large limbs from trees without stripping bark from the trunk. It involves a series of three (3) cuts.

Landscape Installation. The actual construction of the landscape.

Landscape Maintenance. The care and upkeep of landscape after its installation.

Landscaping. The profession involving the design, installation, and maintenance of the outdoor living environment.

Leaching. The dissolving of materials/nutrients in the water which is present in the soil, causing the material to quickly pass the point at which plant roots can benefit from them.

Lime. A powdered material used to correct excess acidity in soils.

Loam. Soil that contains approximately equal amounts of clay, silt, and sand; an ideal soil condition.

Mulch. A material placed on top of soil to aid in water retention, regulate soil temperature, and discourage weed growth.

Mulching Mower. Mowing machines specially equipped to cut grass blades into minute particles that are small enough to fall back into the living turf, providing mulch. Grass catchers are not required and disposal of clippings is no longer necessary.

Native Plant. A plant that evolved naturally within a certain locale.

Naturalized Plant. A plant that was introduced to an area as an exotic plant, but adapted so well that it appears native.

Noxious Weeds. Persistent perennial weeds defined by law in most states, which are especially difficult to control.

Nutrient Ratio. A comparison of the proportions of each nutrient within a fertilizer. An example would be that a 5-10-5 analysis has a 1-2-1 ratio of ingredients.

Parcel. A designated or specified area of land.

Perennial. A plant which lives more than two (2) growing seasons, usually dormant during the winter.

Pesticide. A chemical used for the control of insects, plant diseases, or weed control.

pH. A measure of the acidity or alkalinity of soil or water. A pH of 7.0 is considered neutral, below 7.0 acidic, and above 7.0 alkaline (basic).

Pruning. The removal of a portion of plant for better shape or to stimulate growth.

Puddling. The collection of water, usually in low-lying areas, often the result of soil compaction to the extent that water will not soak in.

Quickly Available Fertilizer. A fast-acting fertilizer containing water-soluble nitrogen for immediate release.

Reel Mower. A lawnmower having blades which rotate in the same direction as the wheels and cut grass by pushing it against a fixed bed knife located at the rear base of the mower.

Rhizome. An underground stem from a parent plant that sends up new shoots and develops new roots to become an independent plant.

Rotary Mower. A lawnmower with blades that move parallel to lawn surfaces, cutting grass as they revolve.

Scaffold Branch. A lateral branch of a shrub or tree.

Shrub. A multi-stemmed plant which is smaller in size than a tree.

Slow-Release Fertilizer. A slow-acting fertilizer having non-soluble nitrogen for more efficient plant intake.

Sodding. A method of lawn installation which uses strips of living grass. Though it is more costly, the major advantage is an instant lawn.

Spare The Air Day. A period of days designated by the Bay Area Air Quality Management District (BAAQMD) as a time when people are asked voluntarily to make an effort to minimize polluting activities such as driving, lawn mowing, leaf blowing, barbequeing, etc. on days when it is forecasted by the Air Quality Management District to meet or exceed the Federal health standard of 100 on the Pollutant Standards Index (PSI) chart. A level above 100 means the air is unhealthy for human consumption.

Specimen Plant. A plant that is distinctive because of special foliage, branching pattern, or flower/fruit colors. Used as a focal point in landscape.

Sprinkler Irrigation. Pressurized water applied over the tops of plants.

Stolon. Stems that grow from parent plants parallel to the ground, developing into new and independent plants.

Sucker. A shoot developing from the roots or lower part of the stem of a plant that is abnormal and generally undesirable.

Sunscald. A temperature-caused form of injury occurring in winter, the result of freezing and thawing which, in turn, results in irreplaceable water loss and tissue drying.

Thatch. Dead grass clippings located around living grass that lay on the surface of the soil, creating a potentially unhealthy situation.

Trickle Irrigation. Water provided directly to plant root zones.

Trimming. A neat, uniform, level appearance of vegetation achieved by cutting or clipping, and a tapered appearance at plant bed perimeters.

Vertical Mowing. Mowing technique using a power rake or mower blades that strike vertically into the turf to break up soil plugs or remove excessive thatch.

Water Sprout. An unproductive sucker-like shoot that grows from an adventitious or latent bud on a tree. These sprouts are abnormal and undesirable.

Weed. A plant having no economic value, which grows in a place where it is not wanted.

Wetting Cycle. Short watering duration on an automated sprinkler timer that allows irrigation water to soak in and reduce water run-off. Also known as a wicking cycle.

Windburn. Drying out of plant tissue caused by cold winter winds.

Winter Injury. Any damage done to the landscape as a result of cold winter weather.

C10.3 GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES

Refer to Section C3.

C10.4 CONTRACTOR FURNISHED ITEMS

C10.4.A Products.

C10.4.A.1 Fertilizer. Fertilizer shall be of commercial grade, granular and uniform in composition, and contain the specified analysis of nutrient elements of nitrogen, phosphorus, and

potassium as ordered, based on results of soil tests or Government recommendations. Fertilizer shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis, name, trade name, trademark, and indication of conformance with Federal and State laws. In lieu of containers, fertilizer may be furnished in bulk if accompanied by a certificate indicating the above information with each delivery. Any fertilizer that becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted.

- C10.4.A.2 Topsoil. Topsoil shall be natural, fertile, friable soil possessing the characteristics of representative productive soils in the vicinity. Topsoil shall be obtained from naturally well-drained areas and shall not be excessively acid or alkaline nor contain toxic substances which may be harmful to plant growth. Topsoil shall exhibit a dark, rich color without admixture of subsoil, and shall be clean and reasonably free of clay, lumps, stones, roots, or similar substances two (2) inches or more in diameter, debris, or other objects which may be a hindrance to planting operations.
- C10.4.A.3 Mulch. Mulch for shrub and tree establishment, plant bed mulching, and grassing shall be commercially prepared or materials taken from the ARC composting site located on the old VTOL pad at ARC, Facility NA 292.
- C10.4.A.4 Sand. Sand shall be builders' grade, washed sand.
- C10.4.A.5 Lime. Lime shall conform to ASTM C 602-95a, ground pelletized, commercial agricultural limestone containing a minimum of 94 percent of total carbonates, 80 percent calcium, and 14 percent magnesium. Provide the following ASTM E 11-01 gradation: Minimum 86 percent passing the No. 20 sieve and 28 percent passing the No. 100 sieve.
- C10.4.A.6 Plants, Shrubs and Trees. All plants specified as ordered shall be nursery grown and shall bear certification indicating species, common name, and grade. Plants shall be healthy living specimens that are considered to be number one (1) grade stock and California native where applicable. California native plants shall be nursery grown from locally harvested wild seed stock. Plants shall always be the best suited variety for the local area and conditions. Flowers and ground cover shall be planted the same day purchased. Shrubs shall be of the five (5) gallon size (unless otherwise approved by the COTR), and trees shall have trunk diameters of at least one (1) inch DBH.
- C10.4.A.7 Lawn Seed. Lawn seed shall be locally blended tall fescue, the latest season's crop, having a minimum germination rate of 80 percent and maximum weed seed content of one (1) percent and shall be delivered to the site in original sealed packages bearing the producer's guaranteed analysis for purity, germination, weed seed content, and inert material. Seed shall be labeled in conformance with 7 CFR Chapter I, Part 201, and applicable State seed laws. Wet, moldy, or otherwise damaged seed is not acceptable.
- C10.4.B Pesticides. All pesticides used shall be labeled and registered by the Environmental Protection Agency. All pesticide usage shall be in strict accordance with label directions. Any changes in pesticide usage shall have prior written approval by the Environmental Management Division at ARC. The Contractor shall maintain a Material Safety Data Sheets (MSDS) book of all pesticides to be used and have it readily available at all times at the pesticide application site. Pesticides brought on-site shall be ready to use, as mixing and storage on-site is prohibited. The Contractor shall not apply pesticides to landscaped areas, buildings, facilities, or structures when people are in the areas to be treated. The Contractor shall schedule pesticide application work to coincide with other than normal working hours of all occupied landscaped areas, buildings, facilities, or structures.

C10.4.C Equipment. The Contractor shall supply all fuel, lubricants, and spare parts; and provide repair and maintenance as necessary to keep all equipment in good operating condition, to include and take appropriate action regarding the following:

C10.4.C.1 All tanks, hoses, pumps, control valves, and gauges shall be free of visible deterioration, shall not leak, and shall operate at the manufacturer's recommended rates and pressures. Equipment that has failed shall be replaced and/or repaired by the Contractor prior to resuming operations.

C10.4.C.2 Screens, strainers, and filters shall be used and maintained in accordance with the pump, sprayer, and/or nozzle manufacturer's instructions.

C10.4.C.3 Spray nozzles shall deliver spray patterns as specified by the nozzle manufacturer. Nozzles that become clogged or eroded shall be repaired or replaced by the Contractor prior to resuming operations.

C10.4.C.4 Markings. All pesticide dispersal equipment, including bait stations and trays, shall be clearly and plainly marked with "DANGER", "PESTICIDES", or as required by applicable regulations.

C10.4.D Vehicles.

C10.4.D.1 Safety Equipment. Vehicles used to transport pesticides shall have secured and labeled pesticide storage, and be equipped with a fire extinguisher, spill and decontamination kits, and emergency wash water that meets all EPA and local laws and regulations. Each Contractor vehicle shall display the Contractor's name and local telephone number so that it is clearly visible, and at all times, display a valid State of California license plate, safety inspection sticker (if applicable), and state pest control license number prominently on the sides of each vehicle coming on site to perform contract pest control work.

C10.4.D.2 Security. All pesticides carried on vehicles shall be secured in locked compartments at all times on Government property. Vehicles shall not be left unattended at any time unless properly locked and secured.

C10.4.D.3 Appearance. All vehicles shall be maintained with a clean and orderly appearance, free from observable pesticide spills, residues, or build-up.

C10.5 FIXED PRICE WORK

The Contractor shall perform the following contract requirements per the Performance Requirements Summary (PRS), Attachment 3, Section J, at frequencies or performance criteria specified within each contract requirement:

C10.5.A Trouble Calls (TC). The Contractor shall provide grounds maintenance and pest control services for all related TC as required to meet the general intention of this section (See Paragraph C10.1.B). All TC shall be issued in accordance with Section C5.2, Firm Fixed Price Work; Trouble Calls.

C10.5.B Contract Requirement No. C10-501, Integrated Pest Management (IPM).

Code Compliance Standard(s) – ANSI Standards, Executive Order 12856, 13148, 13101

Attachment(s) – 2.10.13, Section J, NASA ARC IPM Program Plan Sample

PM Checklists – C10-501, Section J.

The Contractor shall be required to undergo IPM Program orientation/training within the first six (6) weeks following the contract award. This orientation will be arranged for the Contractor by the Government and at Government expense. The Contractor shall interface with the Government IPM Coordinator and follow ARC IPM standards.

- C10.5.B.1 Identification. The Contractor shall identify all pests and natural enemies located in all landscaped areas, and in all ARC and designated MAC buildings and facilities. This shall include a listing of all known insects and animal life found to exist on site. Identification shall also include any problem areas, structural features, potential areas for pest infestation, or personnel operational practices contributing to pest infestations, and any other constraints.
- C10.5.B.2 Monitoring. The Contractor shall monitor all pests on an as-needed basis for the duration of the contract. Frequency and intensity of monitoring for each site will vary, depending on pest occurrence. However, the Contractor shall monitor, document, and report on all findings at Building 235, Building 270, and the Buildings 19, 583A, and 583B on a bi-weekly basis minimum or more frequently as activity warrants. The goal at these locations is to accomplish a zero tolerance pest level. The Contractor's method for monitoring pest populations shall be specified using floor or area plan maps and detailed descriptions.
- C10.5.B.3 Documentation. The Contractor shall develop a documentation system for regular sampling of pests. Sampling shall be performed per acceptable IPM methods, and those methods shall be referenced in the Contractor's reports and records.
- C10.5.B.4 Injury Level Determination. The Contractor shall determine the injury level (relative nuisance level of the pest(s) to the human population), based on the presence of any pest population correlated with any resultant injuries (damage or disruption to normal work activities the pest(s) may cause if left untreated) that are severe enough to justify treatment. The Contractor shall provide an integration of treatment methods that are least disruptive to natural controls, least hazardous to human health and the environment, but effective against the target pest.
- C10.5.B.5 Action Level Determination. The Contractor shall determine an action level based on the pest population size, together with weather conditions or other variables, from which injury level predictions can be derived. Predictions shall include injury levels and timeframes based on the assumption that no treatment is taken.
- C10.5.B.6 Evaluation. The Contractor shall provide an evaluation system to determine the outcome of his/her treatment actions. The Contractor shall show that the IPM activities are successful in containing but not necessarily eradicating pests.
- C10.5.C Contract Requirement No. C10-502, Level I Grass Cutting.
Code Compliance Standard(s) – ANSI Standards
Attachment(s) – 2.10.01, Section J, Landscaped Areas Inventory; 2.10.02, Section J, Landscape Areas Location Maps
PM Checklists – C10-502, Section J.
- C10.5.C.1 Debris Collection and Removal. Prior to cutting, remove any trash, litter, fallen branches, or other similar debris that would detract from the finished appearance of the cut grass, planter beds, walkways, and building entrances, or present a safety hazard within the maintenance area. Leaves shall be collected and delivered to the ARC composting site located on the old VTOL pad at ARC, Facility NA 292.
- C10.5.C.2 Grass Cutting. All parcels designated as "Level I" (fine grass turf areas), shall be cut regularly and maintained to a uniform height between 2 and five (5) inches. All surface

disruptions including, but not limited to, gopher mounds, mole mounds, ruts, and surface depressions shall be leveled with soil and any resulting holes filled prior to mowing except active burrowing owl burrows (see Paragraph C10.5.P). If any bare ground within the designated limits of a parcel becomes vegetated with grass, weeds, or other similar growth through natural spread, not artificially planted, it shall be maintained as part of the fixed price contract. Grass cutting is to be accomplished free of scalping, rutting, bruising, and uneven and rough cutting producing a neat, clean, even cut. Mulched grass clippings shall be uniformly distributed over the mowed area and shall not be windrowed or deposited in piles or clumps. Un-mulched grass clippings shall be collected and completely removed from the lawn surface and delivered to the ARC composting site. All sidewalks shall be edged each time the grass is cut. Following cutting, grass clippings and trimmings shall be removed from sidewalks, streets, and other paved areas the same day the grass is cut. The Contractor shall collect grass clippings and trimmings in a timely manner to prevent dispersion over paved areas. Be aware of pedestrians when mowing and take cautionary measures to prevent injury to others. Edging shall be performed in accordance with Paragraph C10.7.M, Edging.

C10.5.C.3 Grass Trimming. Trimming around obstacles and along edges of adjacent raised surfaces including, but not limited to, trees, shrubs, flower and shrub beds, cultivated areas, poles, guy wires, fire hydrants, valves, sidewalks, curbs, pavements, garbage pads, wooden borders, and walls shall be accomplished to match the height and appearance of the surrounding mowed grass. Herbicide treatment shall not be allowed. Trimming shall be considered a part of grass cutting and shall be accomplished concurrently (the same day); therefore, grass cutting will not be considered complete until all trimming operations are accomplished. Be aware of pedestrians and vehicles when edging along sidewalks and take cautionary measures to prevent injury to others.

C10.5.D Contract Requirement No. C10-503, Level II Grass Cutting.

Code Compliance Standard(s) – ANSI Standards

Attachment(s) – 2.10.01, Section J, Landscaped Areas Inventory; 2.10.02, Section J, Landscape Areas Location Maps

PM Checklists – C10-503, Section J.

All parcels designated as "Level II" (Kikuyu turf) shall be cut regularly and maintained to a uniform height between two (2) and four (4) inches. All other work requirements and standards of performance shall be identical to Contract Requirement No. C10-502, Level I Grass Cutting, except that trimming around obstacles other than bushes, trees, and building perimeters may be accomplished by herbicide treatment. Trimming with herbicide treatment shall be confined to an area extending six (6) inches from the object being trimmed and shall conform to the requirements for vegetation control specified in Contract Requirement No. C10-510, Chemical Applications for Landscape Pest Control, Weed Abatement, Growth Inhibitors. To prevent the spread of Kikuyu grass, mowers shall be cleaned prior to mowing a Level I grass cutting area or utilize dedicated mowers for Kikuyu lawns. All Kikuyu related material shall be disposed of at an approved off-site location.

C10.5.D.1 Flail mowing, also referred to as de-thatching or hammer-knifing, of Kikuyu turf shall be conducted by the Contractor annually during the dormant season, January through March. The Contractor shall remove all thatched materials from the work site within 24 hours, and dispose of at an approved off-site location.

C10.5.E Contract Requirement No. C10-504, Level III Vegetation Control.

Code Compliance Standard(s) – ANSI Standards

Attachment(s) – 2.10.01, Section J, Landscaped Areas Inventory; 2.10.02, Section J, Landscape Areas Location Maps

PM Checklists – C10-504, Section J.

All parcels designated as "Level III" and paved areas shall be cut and/or sprayed to control weed growth, to remove visual and physical obstructions, and to reduce fire hazard. Minimum height for Level III mowing is four (4) inches. Cut materials shall be mulched or removed to prevent piling or windrows on the surface.

- C10.5.E.1 Roadway Shoulders and Ditches. The Contractor shall cut and/or spray regularly and maintain roadway shoulders and ditches to a average height between four (4) inches and 12 inches in a bounded delineated area, all vegetation growing along the roadway shoulders in all unimproved areas, to a distance of 12 feet on each side. However, herbicides shall not be used in the ditches along East Patrol Road and Marriage Road, or within 250 feet of an active burrowing owl burrow during nesting season and 160 feet outside of nesting season. All roadway shoulders adjacent to ditches (canals) shall be maintained to include the area from the bottom of the ditch, or to six (6) inches above the level of water if filled, to the edge of the dirt, gravel or asphalt roadway surface, or curb as applicable. Inland ditches shall be maintained to include the ditch bottom, if dry, or to six (6) inches above the level of water, if filled. Ditches shall be cleared in accordance with Section C20, Environmental and Emergency Support Services.
- C10.5.E.2 Field Mowing. The Contractor shall mow fields as identified on the landscape drawings. Following the initial mowing, which timing is determined by the formation of annual grass seed heads, the Contractor shall cut and regularly maintain all fields to an average height between four (4) inches and 14 inches for each area delineated by the taxiways as shown on the landscaping maps (See Contract Requirement No. C10-512, Safety and Environmental Requirements). The Government will notify the Contractor when to perform the initial field mowing, which will be based on grass seed head production each year. Anticipated first mowing usually occurs in March, starting with the burrowing owl preserve areas followed by open field areas.
- C10.5.E.3 Building and Facility Clearance. The Contractor shall maintain the perimeters of all buildings, power sub-stations, fuel pits, storage areas, and all other permanent structures, clear of flammable vegetation and combustible growth to a distance of 30 feet per the California Fire Code. This may be accomplished by spraying approved pre-emergent and post-emergent herbicides.
- C10.5.E.4 Airfield Lights and Markers Clearance Requirements. The Contractor shall maintain, at all times, all airfield paved surface edge lights and markers visible and clear of all obstructions within a three (3) foot minimum radius. This may be accomplished with approved herbicides. (Estimated number of lights and markers that are airfield related = 972)
- C10.5.E.5 Airfield Equipment. The Contractor shall maintain clear of all obstructions within a 25 foot radius of the two (2) air navigation systems, and within a ten (10) foot radius of the weather observation system.
- C10.5.E.6 Paved Surfaces Crack Clearance. The Contractor shall maintain all roadways, curbs, gutters, parking lots, sidewalks, runways, taxiways, and apron cracks free of vegetation. This shall be accomplished by mechanical and/or approved chemical herbicide applications. Both pre-emergent and post-emergent chemicals shall be employed.
- C10.5.E.7 Ground Cover Renovation. In addition to routine containment maintenance, including ground cover clearance around trees, shrubs, signage, etc., the Contractor shall cut back superfluous wood in the fall or winter months to provide a general thinning of all ground cover plants such as ice plant and ivy.
- C10.5.F Contract Requirement No. C10-505, Landscape Irrigation.

Code Compliance Standard(s) – ANSI Standards

Attachment(s) – 2.10.07, Section J, Irrigation System Equipment Inventory; 2.10.08, Section J, Irrigation System Location Maps

PM Checklists – C10-505, Section J.

The Contractor shall manage the irrigation of ARC and MAC landscapes to promote healthy plants, turf, and trees while conserving water and minimizing waste.

- C10.5.F.1 Watering shall be performed during the cool part of the day as practicable, generally between the hours of 8:00 pm and 7:00 am in order to gain maximum benefit of water applied. Reclaimed water may be used with the approval of the COTR. Frequencies and duration of water applications shall be closely monitored to ensure that landscape plants receive adequate, but not excessive water. Run-off and flooding conditions are not allowed. Watering operations shall always be concluded by a reasonable hour to avoid wetting building entrances, parked automobiles, and passing pedestrians. Settings and/or patterns shall be closely monitored to ensure compliance with all requirements set forth in this section. The Contractor shall flag all broken or maladjusted system components, is responsible for repairs and alterations from the sprinkler irrigation valve(s) (inclusive of valves) to the sprinkler head(s), and shall contain gushing water same day and make all adjustments/corrections within five (5) working days. All repairs not completed within this time frame shall be reported to the COTR with written explanation by the following working day.
- C10.5.F.2 Manual watering shall be accomplished by whatever means necessary, be it setting water-tractors, sprinklers, soakers, etc. When hand valves are opened, irrigation systems shall be inspected each time for line breaks and head problems, and landscape areas shall be inspected for excessive puddling and run-off conditions that must be prevented.
- C10.5.F.3 Automatic systems shall be monitored by the Contractor to adjust or correct clock settings, watering times, and to identify problems that may arise. The Contractor shall provide wetting cycles on all automated systems to conserve water. The Contractor is also responsible for annual replacement of batteries in battery-operated systems, and for repairs and alterations of the automatic controller (exclusive of AC electrical input) to the sprinkler valve solenoid(s). An updated inventory file of all controllers with specific locations and pertinent data shall be kept on file electronically.
- C10.5.F.4 Manual and automatic irrigation systems shall be adjusted upon notice by the COTR to accommodate special events on Center. Typically, this involves shutting off irrigation systems for special events to allow for dry conditions. The COTR will give the Contractor at least three (3) working days notice of any future event where irrigation times may be affected. After an event, the Contractor shall resume normal watering services for that area.
- C10.5.F.5 Drip irrigation systems shall be monitored and repaired as required to keep the system operational per intended design and function.

C10.5.G Contract Requirement No. C10-506, Shrub Pruning.

Code Compliance Standard(s) – ANSI Standards

Attachment(s) – 2.10.06, Section J, Shrub and Plant Bed Location Maps

PM Checklists - C10-506, Section J.

Pruning shall be accomplished to:

- C10.5.G.1 Reduce the size and growth rate of each shrub by clipping approximately 20 to 30 percent of the total surface area.
- C10.5.G.2 Evenly form and balance the shrub or bush in order to shape it according to its natural growth habits and/or contoured to the physical surroundings.
- C10.5.G.3 Remove dead, damaged, or diseased growth. If the entire shrub or bush is found to be dead, remove the entire plant to six (6) inches below ground level. The hole and any other surface damage caused by removal shall be repaired to match the surrounding area.
- C10.5.G.4 Remove vines, suckers, water sprouts, and any other extraneous vegetative growth from under and on the shrubbery or bushes.
- C10.5.G.5 Prune or remove growth in front of doors and windows where visibility is restricted, adjacent to entranceways or walkways where foot-traffic is impeded, and where vision is obstructed at street intersections. Shrubs shall be pruned back along walkways to allow up to one (1) foot each side of the walk, as long as this can be achieved without harm to the plant.
- C10.5.G.6 All pruned vegetation shall be removed from the site the same day, cut and removed to the ARC composting site staging area for composting purposes. Composting materials shall be accomplished under Section C20.5.N, Environmental and Emergency Support Services; Contract Work Elements; Contract Element No. C20-512, Composting Material.
- C10.5.H Contract Requirement C10-507, Tree Pruning.
Code Compliance Standard(s) – Moffett Federal Airfield Planning Guidelines and Standards, and National Arborist Association Pruning Standards for Shade Trees.
Attachment(s) – 2.10.03, Section J, Tree Inventory; 2.10.04, Section J, Tree Inventory Location Maps
PM Checklists - C10-507, Section J.
- C10.5.H.1 Annual Cycle Pruning. The Contractor shall perform Class II, or better, cyclical pruning (15 percent of ARC and MAC tree population per year) based upon the data listed in the Tree Inventory as shown in Attachment 2.10.03, Section J, whereby broadleaf and deciduous types are cycle pruned once every five (5) years, and coniferous types are cycle pruned once every seven (7) years. The Contractor shall submit his/her initial cycle pruning schedule during the Phase-In period, and annually thereafter, to the COTR for his/her review and acceptance prior to initiating work. The Contractor shall update the tree inventory list as changes occur.
- C10.5.H.2 Pruning, General. The Contractor shall remove all suckers, water sprouts, and dead or damaged branches up to a minimum height of seven (7) feet (on trees over ten feet tall) and to a maximum height of 16 feet to allow for vehicular traffic clearance. Lower branches, where obstructions may exist to foot traffic, shall be pruned to an eight (8) foot minimum height, and foliage to a seven (7) foot minimum height. The Contractor shall deliver all tree prunings to the ARC composting site staging area for composting purposes. Composting materials shall be accomplished under Section C20.5.N, Environmental and Emergency Support Services; Contract Work Elements; Contract Element No. C20-512, Composting Material.
- C10.5.H.3 Pruning for Disease Control. The Contractor shall prune to control diseases (e.g. fireblight) as it appears. The Contractor shall take all necessary precautions to avoid further spread of such contagious diseases. Fireblight pruning requires tool disinfecting between each cut, bagging and removal of prunings, and adequate wood (up to 12

inches) shall be removed to ensure elimination of infected tissue. The Contractor shall monitor and control the spread of all contagious plant diseases. Blighted materials shall be removed from the center and not deposited at the ARC composting site, as they may spread disease. All diseased material shall be disposed of at an approved off-site location.

- C10.5.H.4 Requirement for Qualified Tree Workers and Certified Arborist. Qualified tree workers under the direction of a Certified Arborist shall perform all major pruning activities. Minor pruning, limited and selective work involving limbs less than three (3) inch diameter, may be performed by general landscape personnel, provided proper techniques are employed. All pruning shall employ the jump-cut technique when saws are used. All pruned materials shall be removed from the work site immediately.

- C10.5.J Contract Requirement C10-508, Plant Bed Cultivation and Mulching.

Code Compliance Standard(s) – ANSI Standards. 29 CFR 1910

Attachment(s) – 2.10.05, Section J, Plant/Shrub Inventory; 2.10.06, Section J, Shrub and Plant Bed Location Maps

PM Checklists - C10-508, Section J.

Shrub and flower plant beds shall be cultivated following the rainy season. Cultivation shall extend a sufficient horizontal distance out from bases of plants to ensure their protection from damage by lawn mowers and trimmers, and to provide proper care for the plants, but in no case less than a circle of 18 inches diameter. Initial seasonal cultivation shall extend down to a soil depth of two (2) inches, with care to ensure that the roots of the plants are not damaged. All edges shall be worked to a neat and true line. All timber, brick, concrete, aluminum, or plastic bed edging shall be replaced as needed. Successive seasonal cultivation shall be limited to removal of undesirable vegetation (weeds and grass) and other debris. Following cultivation, new mulch shall be provided and placed on the surface of beds to achieve a minimum total depth of four (4) inches. Materials from the chipping/shredding operation shall be used as mulch. Debris encountered during cultivation shall be removed and disposed of the same day.

- C10.5.J.1 Annual Color Replacement. Remove and replace annual flowers in circle in front of Building 200 and in the planters at Building 003 semi-annually. Selection of plants shall be approved by the Government prior to planting.

- C10.5.K Contract Requirement C10-509, Fertilization.

Code Compliance Standard(s) – ANSI Standards. 29 CFR 1910

Attachment(s) – 2.10.02, Section J, Landscape Areas Location Map

PM Checklists - C10-509, Section J.

The Contractor shall fertilize lawns and shrubs as required to promote healthy and vigorous growth and appearance. Fertilizer that spills onto pavement surfaces shall be swept up same day as application. Fertilizer shall be applied per Paragraph C10.7.H, Fertilization.

- C10.5.L Contract Requirement C10-510, Chemical Applications for Landscape Pest Control, Weed Abatement, and Growth Inhibitors.

Code Compliance Standard(s) – ANSI Standards. 29 CFR 1910

Attachment(s) – 2.10.02, Section J, Landscape Areas Location Map

PM Checklists - C10-510, Section J.

The Contractor shall furnish all labor, certified applicators, management, supervision, tools, materials, equipment, and transportation to provide pest control services, abate weeds, and inhibit growth or fruit development at ARC and MAC. The Contractor shall post warning signs

in all bounded delineated areas treated, leaving signs in place until the product has dried, soaked in, or is otherwise safe. Weeds shall be removed from the center and not deposited at the ARC composting site, as they may contaminate the composting material.

- C10.5.L.1 The Contractor shall report to the COTR any evidence of pest or conditions conducive to pest infestation that are not covered in the contract, at the time such condition is first noticed.
- C10.5.L.2 Landscape Pest Control. Landscape pest control services shall be provided for a variety of animals and insects when found to be endangering the landscape turf, trees, shrubs, plants, utility systems, or when creating a health or safety hazard or causing aesthetic damage with the exception of endangered or protected species. These services shall be performed at any time, as required to eliminate threats, damage, hazards, or infestations. The Contractor shall anticipate and apply dormant spray controls to prevent spring infestations such as mildews and various other diseases and parasites. Chemical pesticides shall be limited in the California native garden locations. Biological controls are preferred in native gardens, but any other method of control requires approval by the Government.
- C10.5.L.3 Vegetation Control. The Contractor shall provide vegetation control to eliminate growth on crushed stone, gravel, soil-aggregate, within the power sub-station compounds, fuel pits, from roadway and walkway cracks, and from landscaped bed areas. The Contractor shall use a non-selective, non-residual contact type herbicide that is environmentally the least toxic and most effective material available. The Contractor shall determine how often a herbicide must be applied to obtain total vegetation control, and shall use approved pre-emergent and post-emergent herbicides to maintain control for the entire term of the contract. The Contractor shall not use herbicide in areas where there is a possibility of killing desirable vegetation. The Contractor shall be responsible for the replacement of desirable landscape plants lost as a result of Contractor negligence, at no additional cost to the Government.
- C10.5.L.4 Inhibitors. The Contractor shall apply approved growth and fruit inhibitors to slow down shrub growth and inhibit fruiting in trees like Olive and Hackberry. The Contractor is responsible for determining the need and scheduling the work for best results.
- C10.5.M Contract Requirement C10-511, Fence Clear Zones.
- Code Compliance Standard(s) – ANSI Standards. 29 CFR 1910
- Attachment(s) – 2.10.02, Section J, Landscape Areas Location Map
- PM Checklists - C10-511, Section J.
- The Contractor shall provide vegetation control to eliminate growth along all fence lines. The Contractor shall coordinate landscape maintenance with appropriate landowners outside the perimeter fences. The Government will provide points of contacts. All cut vegetation shall be removed the same day. The Contractor shall use weed trimmers and/or a non-selective, non-residual herbicide to prevent future growth, and shall maintain fence lines vegetation-free for the entire term of the contract.
- C10.5.M.1 Perimeter Metal Fabric Fencing. The Contractor shall cut and remove all existing vegetation from the perimeter fence lines from ground level to the top of the fence, and extending out for three (3) feet in width on each side of the fence line including the bicycle path from Stevens Creek levee to R.T. Jones Road. Additional clearance up to ten (10) feet on each side of the fence lines may be required at certain locations.

- C10.5.M.2 Perimeter Tubular Aluminum Fencing. The Contractor shall cut and remove all existing vegetation from the fence line from ground level to the top of the fence. No herbicide treatment shall be used along this type of fence line.
- C10.5.M.3 Perimeter Solid Walls. The Contractor shall cut and remove all existing vegetation from the from ground level to the top of the wall on the interior side of the wall only. Remove all vegetation to provide minimum four (4) feet clearance from the top of the wall.
- C10.5.M.4 Interior Fencing. The Contractor shall cut and remove all existing vegetation from beneath the fence and from ground level to the top of the fence. Post emergent treatment is acceptable along this type of fence line.
- C10.5.N Contract Requirement C10-512, Debris Removal.
Code Compliance Standard(s) – ANSI Standards. 29 CFR 1910
Attachment(s) – 2.10.01, Landscaped Areas Inventory; 2.10.02, Section J, Landscape Areas Location Maps
PM Checklists - C10-511, Section J.
- C10.5.N.1 The Contractor shall pick up site debris (*i.e.* papers, cups, leaves, etc.) on a regular basis to maintain landscaped grounds free of unsightly debris. This includes within shrubbery, ground cover, around trees, landscaping within parking lots, around wheel blocks or parking bumpers, from road surfaces, sidewalks, along curbs, delivery areas, and building entrances and perimeters.
- C10.5.N.2 The Contractor shall monitor drainage curbs on a regular basis. Curb areas that provide surface storm water drainage shall be kept clear at all times of debris. Storm water drainage shall never be blocked or impeded due to leaves, dirt, branches, or any landscape debris, especially during the rainy season and during or after a major storm.
- C10.5.P Contract Requirement C10-513, Safety and Environmental Requirements.
Code Compliance Standard(s) – ANSI Standards. 29 CFR 1910; APR 1700.1, NASA Ames Health and Safety Manual; APR 8800.3, Ames Environmental Procedural Requirements
Attachment(s) – N/A
PM Checklists – C10-512, Section J.
- C10.5.P.1 The Contractor shall work in accordance with all applicable Safety requirements as set forth in the NASA Ames Health and Safety Manual (APR 1700.1), Ames Environmental Procedural Requirements (APR 8800.3), and provisions listed under Section C1.4, General Information and Requirements; General Administrative Requirements.
- C10.5.P.2 The Contractor shall always protect endangered and protected species as outlined under Section C1.4.C, General Information and Requirements; General Administrative Requirements; Environmental Protection and Policies. A Burrowing Owl Location Map is shown in Attachment 2.10.11, Section J. The Contractor shall note the locations of burrows of burrowing owls on an on-going basis, and shall maintain required clearance from burrows and refrain from performing any work function (*i.e.* ground squirrel eradication) in their immediate vicinity. No herbicides shall be used within 250 feet of any active burrowing owl burrow with nestlings (usually occurring during the breeding season 01 FEB – 31 AUG), and 160 feet during all other occurrences. The Contractor shall consult with the Ames Wildlife Biologist regarding any individual burrows within or adjacent to work performed. The Ames Wildlife Biologist shall delineate active burrows within two weeks of notification by the Contractor that spraying is required in designated areas. All burrows located in mowed grass areas shall be carefully trimmed with a tractor-type mower, cutter, and/or hand-worked, so as not to damage the burrows or destroy burrow entrances. Any active owl burrow not shown on the map shall be

reported to the COTR or designated person within 24 hours of sighting. Government updated maps will be provided on a periodic basis. Bird nests identified by stakes shall be noted prior to field mowing. Unmarked bird nests found by work crew during mowing shall be appropriately identified and avoided to not disturb the nesting area. The Western Pond turtle is another protected species found in the canals on the east side of Moffett Field. All work on levees or around the canals shall be coordinated through the Ames Wildlife Biologist.

C10.5.P.3 When the Bay Area Air Quality Management District (BAAQMD) issues an alert designating a "Spare The Air Day", the Contractor shall not operate gas- powered equipment (excluding mowers) in the performance of work on that day to help reduce air pollution. Advisories are issued by the BAAQMD through numerous television and radio stations and employers to inform the public that a "Spare The Air Day" has been forecast. In addition, announcements are available anytime by telephoning (800) 435-7247, a recorded air quality forecast line, or by visiting the web site at <http://www.sparetheair.org/>.

C10.5.Q Contract Requirement C10-514, Maintain Recreation Areas.

Code Compliance Standard(s) – ANSI Standards. 29 CFR 1910

Attachment(s) – 2.10.02, Section J, Landscape Areas Location Maps

PM Checklists - C10-513, Section J.

The Contractor shall maintain areas designated as recreation areas to the standards set forth in Contract Requirement No. C10-502, Level I Grass Cutting, with the inclusion of the following requirements.

C10.5.Q.1 Playground Areas.

C10.5.Q.1.a Play Structure Pits. The fill material shall be loosely packed to a minimum depth of 12 inches, and free of rocks, trimmings, weeds, grass, animal feces, and foreign debris. Fill material shall be replenished as required to maintain its original intended appearance. Fill material shall be of same or like kind, or as recommended by the manufacturer.

C10.5.Q.1.a(1) Sandboxes. The Contractor shall maintain fill up to within two (2) inches below the top of the outer boundary.

C10.5.Q.1.a(2) Exercise Par Course. The Contractor shall clear weeds and debris around all structures and grade as required.

C10.5.Q.1.a(3) Tennis and Basketball Courts. The Contractor shall keep fence lines clear, clear weeds and debris from courts, and sweep court surfaces from dirt accumulation.

C10.5.Q.1.a(4) Golf Putting Green. The Contractor shall keep weeds, leaves, and debris off putting green and accumulating inside cups.

C10.5.Q.2 Volleyball Courts (Facilities 965 and NA 301). The fill material (sand) shall be loosely packed, scarified to a minimum depth of 12 inches, and free of rocks, trimmings, weeds, grass, animal feces, and foreign debris. Sand shall be replenished as required to maintain its original intended appearance. Sand shall be graded, washed playground-type sand. Volleyball courts shall maintain sand up to within three (3) inches below the top of the outer boundary of the pits. A straight clean edge line shall exist at all times between all sand to grass transitions which lawn growth not to exceed 1-1/2 inches beyond the normal edge line location.

- C10.5.Q.3 Baseball Fields (Chase Park Facilities 966 and 967). The playing fields shall be prepared prior to the start of the baseball season and maintained throughout the season. The official season typically runs from 01 April through 01 September of each calendar year.
- C10.5.Q.3.a Infield Areas. Rocks, weeds, and foreign debris shall be removed from dirt areas. Dirt surfaces shall be raked and leveled.
- C10.5.Q.3.b Outfield Areas. Grass shall be maintained between a height of one and one-half inches(1-1/2) and two and one-half (2-1/2) inches at all times. Mowing schedule shall be coordinated so not to conflict with playing schedule.
- C10.5.Q.3.c Pest Control. Ground squirrels and gophers shall not be permitted inside the fenced playing area and extending 20 feet outside the fence lines. Field damage resulting from burrowing rodents shall be repaired by filling, leveling, compacting surface, and seeding following treatment. See Paragraphs C10.4.B, Pesticides, and C10.7.F, Grass Seeding, for requirements.
- C10.5.R Contract Requirement C10-515, Maintain Native Plant Garden Areas.
- Code Compliance Standard(s) – California Native Plant Society Guidelines For Plant Selection and Maintenance.
- Attachment(s) – 2.10.02, Section J, Landscape Areas Location Maps; 2.10.14, Section J, California Native Plant Gardens
- PM Checklists - C10-514, Section J.
- C10.5.R.1 Water Requirements. The Contractor shall monitor the moisture level at the root zone of native plants on a regular basis during the dry season (01 May to 31 October) at a minimum. Supplemental watering shall be given only as required to sustain various species, depending on their need.
- C10.5.R.2 Irrigation Systems. Watering systems shall be monitored and repaired as needed to assure they're working properly with the native garden sites, especially in areas with drip systems (*i.e.* buildings 201 and 235).
- C10.5.R.3 Pruning Native Plants. Pruning shall be required primarily to remove dead or diseased limbs, or to remove path/sidewalk obstructions. Plants shall generally be allowed to grow in their natural state, so pruning shall be limited. Sucker growth shall be controlled.
- C10.5.R.4 Monitoring. Contractor shall monitor plants for pests or signs of infestations. Implement biological controls to contain infestations. Predatory insects shall be introduced to assist in infestation control and other controls, such as insecticidal soaps may be used to control infestations, but COTR approval is required for chemical pesticide applications in native gardens.
- C10.5.R.5 Mulch. Mulch shall be maintained in the native gardens to a minimum depth of four (4) inches to act as a weed barrier and for moisture retention. Mulch shall be held away from the plant trunks a minimum of six (6) inch radius.
- C10.5.R.6 Plant Replacement. The Contractor shall replace dead or diseased plants with like kind or as directed and approved by the Government. Contractor is encouraged to recommend locations for conversions from conventional to native landscape.

C10.6 DOCUMENTATION AND REPORTING REQUIREMENTS

- C10.6.A Contract Requirement No. C10-601, Landscape Monthly Report. The Contractor shall prepare a monthly landscape activity report containing notation of all completed contract requirements performed during the month, all problems, discrepancies, and omissions shall be listed with full explanations for any failure to perform (*i.e.* inclement weather conditions or dates). The Contractor shall provide one (1) electronic copy and one (1) legible hard copy to the COTR.
- C10.6.B Contract Requirement No. C10-602, Landscape Annual Report. The Contractor shall prepare an annual landscape activity report consolidating activities of the previous 12-month period, including contractual accomplishments and deficiencies. The Contractor shall provide one (1) electronic copy and one (1) legible hard copy to the COTR.
- C10.6.C Contract Requirement No. C10-603, Tree Inventory Annual Report. The Contractor shall submit an annual tree inventory report showing the changes during the previous 12-month period. Report shall include which trees were pruned, the new pruning cycles, and updated statistical information on the trees. Updates to the tree inventory location maps shall also be included that corresponds directly to the inventory report. The Contractor shall provide one (1) electronic copy and two (2) legible hard copies of the report to the COTR plus one (1) legible hardcopy of the updated tree inventory location maps.
- C10.6.D Contract Requirement No. C10-604, IPM Program and Chemical Use Monthly Report. The Contractor shall record all IPM activities and chemical use. The Contractor shall provide one (1) electronic copy and one (1) legible hard copy to the COTR. The chemical use report shall include the material applied, strength of chemical material, amount of chemical applied, location of application, target pest, date of application, and results. In addition, all pesticides and herbicides used shall be tracked by month and year using a graph, and submitted with the report. The Contractor shall retain chemical usage information on file for a minimum of two (2) years as required by the Federal Environmental Pesticide Contract Act (FEPCA).
- C10.6.E Contract Requirement No. C10-605, IPM Program Plan. The Contractor shall submit one (1) electronic copy and one (1) legible hard copy to the COTR of an IPM Program Plan to the COTR within 90 calendar days after start of contract. A sample IPM Program Plan is shown in Attachment 2.10.13, Section J, which addresses the existing program. The plan shall be updated and submitted annually thereafter and shall include any changes implemented to correct problem areas, pest identification listing all insects and animal life on-site, and treatment methods utilized during the year.

C10.7 INDEFINITE DELIVERY INDEFINITE QUANTITY WORK

Indefinite delivery indefinite quantity (IDIQ) work shall be ordered in accordance with Section C7, Indefinite Delivery Indefinite Quantity Work. The Craft Hour Unit Price (CHUP) rates will apply to all IDIQ services in this section. Typical services ordered by the Government are shown below in this section.

- C10.7.A Additional Vegetation Control. Additional vegetation control shall be performed at ordered locations identical to work requirements and standards of performance specified in Contract Requirement No. C10-504, Level III Vegetation Control.
- C10.7.B Tree Pruning. Trees shall be pruned per Contract Requirement No. C10-507, Tree Pruning.
- C10.7.C Tree Removal. Trees, their stumps, and roots shall be removed at ordered locations to a depth of six (6) inches below adjacent ground elevation. The stump hole and any other ground surface damage caused by removal shall be repaired as needed. All debris from tree removal operations shall be delivered to the ARC composting site the day of removal.

- C10.7.D Shrub Establishment. Shrubs of various ordered species shall be planted at ordered locations per accepted nursery standards and procedures to firmly establish new growth, including fertilization, mulching, and watering. The Contractor may invoice and payment will be made for work following completion of initial planting; however, the Contractor shall water and otherwise care for new plants sufficiently to ensure proper development. All plants that die or fail to develop noticeable growth within one (1) year from planting shall be replaced by plants of like size and type by the Contractor, at no additional cost to the Government.
- C10.7.E Tree Establishment. Trees of various ordered species shall be planted and cared for at ordered locations identical to work requirements and standards of performance specified in Paragraph C10.7.D, Shrub Establishment. Trees with weak root systems shall be staked and guyed in at least two (2) directions per accepted nursery standards. Re-staking and retying shall be performed to compensate for tree growth. Guying materials shall be removed once the tree has firmly rooted itself but no sooner than one (1) year from planting.
- C10.7.F Grass Seeding. Damaged, bare and slightly eroded areas that can be repaired with the placement of two (2) inches or less of topsoil shall be filled with topsoil, graded, raked, fertilized, seeded, mulched, and watered to establish a healthy grassed covering at ordered locations. Topsoil shall be placed to a minimum depth of two (2) inches or, if existing in sufficient depth, scarified to a depth of one (1) inch prior to application of fertilizer and seed. Fertilizer shall be uniformly applied at a minimum rate of 2 pounds per 1,000 square foot area. Following fertilization, seed shall be uniformly applied at a rate of six (6) pounds per 1,000 square foot area. Following seeding, mulch shall be placed at a depth of one (1) inch and watered down. Standard erosion control methods, including jute or polypropylene mesh over mulch, or seed impregnated mesh shall be provided in locations of steep terrain and along natural and man-made drainage ways. Establishment shall include providing the necessary continuing care and watering to firmly establish new grass growth. Grassed areas that die or fail to develop noticeable growth for a period of one (1) year after seeding shall be re-grassed by the Contractor at no additional cost to the Government.
- C10.7.G Soil Test Sampling. Soil test sampling shall be conducted at ordered locations. The Contractor shall deliver each soil sample analysis report directly to the COTR. Soil test results will be used by the Government to identify lime deficiencies and fertilizer requirements. A sample soil test report is provided in Attachment 2.10.09, Section J.
- C10.7.H Fertilization. The Contractor shall furnish and uniformly apply fertilizer per manufacturer's recommendations to ordered locations at a rate of 25 pounds per 8,000 square foot area. Fertilizer shall be applied only when grass blades are free of moisture. Incidental bush and shrubbery beds shall be fertilized concurrently, at the same rates.
- C10.7.J Liming. Lime shall be uniformly applied to ordered locations at ordered rates which will vary on existing grassed areas according to results of soil test sampling per Paragraph C10.7.G, Soil Test Sampling, or Government recommendations.
- C10.7.K Seeding. Seed shall be uniformly spread over existing grassed areas at ordered locations applied at a minimum rate of four (4) pounds per 1,000 square foot area.
- C10.7.L Sodding. The Contractor shall prepare area and uniformly placed over prepared areas at ordered locations.
- C10.7.M Edging. The edging operation shall produce neat, clean lines along the vegetated sides of sidewalks and other paved surfaces, and shall be accomplished free of rutting and damage to paved surfaces. Edging shall include removal of grass and vegetation which has encroached onto streets and paved surfaces from adjoining grassed areas including the following locations:
- C10.7.M.1 Cracks in curbing, driveways, and street pavements.

C10.7.M.2 Expansion joints in sidewalks, driveways, and streets.

Debris generated by edging operations, which falls or is thrown onto sidewalks, curbs, gutters, streets, or adjacent grassed areas, causing an unsightly appearance, shall be removed from the site the day of the edging operation and disposed of at the ARC composting site, or removed off Government property, if so advised by the COTR.

C10.7.N Additional Plant Bed Cultivation, Trimming, and Mulching. Additional plant bed cultivation to include trimming of vegetation and mulching shall be performed at ordered locations identical to work requirements and standards of performance specified in Contract Requirement No. C10-508, Plant Bed Cultivation and Mulching.

C10.7.P Additional Grass Cutting. Additional grass cutting shall be performed at ordered locations identical to work requirements and standards of performance specified in Contract Requirement No. C10-503, Level II Grass Cutting.

C10.7.Q Spraying. The Contractor shall provide spraying for the perimeter of exterior buildings and trailers for eradication of insect infestations and insect control using spraying, dusting, or tenting for the control.

C10.7.R Cockroach Control. The Contractor shall obtain cockroach control in all buildings and maintain cockroach control for the specified period on the Contract Task Order (CTO). Cockroach control is defined as no more than three (3) cockroaches spotted in the same building during a 24-hour period. The Contractor shall respond within one (1) working day upon receiving CTO to take appropriate control action to eliminate reported sightings and regain control.

C10.8 DETAILED SPECIFICATIONS

C10.8.A Work Progression. Work activities (i.e. grass cutting, edging, etc.), once begun in a designated area (parcel), shall be completed as specified prior to proceeding to another area, unless otherwise directed by the COTR.

C10.8.B Obstructions. Portable items such as trash containers and other similar items may require temporary relocation by the Contractor to properly maintain grounds areas. All drains on the site, including ditches and pipes, which become obstructed with accumulated grass clippings, soil, mulch, and any other material shall be cleaned.

C10.8.C Notification of Actual or Potential Pest Problems. The Contractor shall report to the COTR any evidence of pest or conditions conducive to pest infestation that are not covered in the contract, at the time such condition is first noticed. The Contractor shall provide a minimum of 24-hour notice of all pest control activity that involves a chemical application.

C10.8.D Storage and Handling. The Contractor shall not store any chemicals, including lime, fertilizer, and seed, on Government property. Seed, lime, and fertilizer shall be protected from becoming damp or wet and shall not be dropped from vehicles when handled.

C10.8.E Pesticide Spills and Decontamination. The Contractor shall be responsible for properly cleaning, decontaminating, and reporting pesticide spills in accordance with Section C20, Environmental and Emergency Support Services.

C10.8.F Pesticide Disposal. The Contractor shall dispose of all pesticides, rinse water, and containers in accordance with label directions and Section C20, Environmental and Emergency Support Services. The Contractor shall not dispose of pesticides, rinse water, and containers on Government property.

- C10.8.G Hives and Nests. The Contractor shall safely remove honeybee hives and relocate them off-site, keeping the bees alive. Work shall be performed by a beekeeper knowledgeable in the removal and transportation of bees. All wasp nests (e.g., hornets, yellow jackets, mud daubers, etc.) shall be destroyed and these insects exterminated.
- C10.8.H Posting Signs. The Contractor shall place warning signs in all areas where chemicals will be applied (excluding non-bounded areas) and provide a minimum of 24-hour notice prior to application to the COTR. The signs shall remain in place until after the chemical(s) are applied and does not present a hazardous or unsafe condition.
- C10.8.J Live Animal Trapping. Live animal trappings are prohibited on the Center. Exceptions include small rodents and reptiles (e.g., squirrels, gophers, snakes, etc.). Predators including cats, skunks, raccoons, red foxes, etc. are controlled by the Environmental Management Division (Code JQ) under the Predator Control Program. All calls are logged into the trouble call log by the Contractor. The trouble call message is transmitted to the applicable points of contact for disposition.
- C10.8.K Native Plants. All new or replacement plantings of shrubs and trees that occur on Center shall be California native plants, except the Shenandoah Plaza Historic District, where new plantings shall match existing.
- C10.8.L Tree Removal. The Contractor shall not remove any trees without prior approval by the Government. The Government shall determine if the tree is a heritage tree pursuant to the Santa Clara County Heritage Tree Ordinance. If so, the requirements of the ordinance shall be met.

END OF SECTION C10

SECTION C11**FACILITY ALARM AND MONITORING SYSTEMS MAINTENANCE & REPAIR****C11.1 GENERAL REQUIREMENTS**

General Intention. The Contractor shall provide all labor, supervision, tools, materials, equipment, incidental engineering, documentation packages required for obtaining permits, and transportation to operate, maintain, and repair the facility alarms and monitoring systems at Ames Research Center (ARC), Moffett Airfield Complex (MAC), and Moffett Housing Annexes (MHA) 1 and 2 for fire alarm transmitters only. The work shall include, but not be limited to, responding to trouble calls (TC); installation, maintenance, programming, repair or removal of: integrated access control/closed circuit television (CCTV) systems, gas detection systems, facility management control system (FMCS), fire alarm systems, access control security systems, and all associated equipment. All work shall be in accordance with requirements as listed in this section and inventory listed in Attachments 2.03.03, 2.11.03, 2.11.04, and 2.11.05, Section J. Information on each type of system is provided in Attachment 2.11.01, Section J.

C11.2 DEFINITIONS

Access Control Security Systems. Systems that provide protection to buildings, structures, and equipment using electronic, mechanical, or procedural techniques. Systems may include detectors both audible and silent, keyed access entrances, electro-mechanical and handicap entrances, stand-alone building panels and associated wiring, host computers, local and remote display units, and printers. See Paragraph C11.7.A for additional details.

Facility Management Control System (FMCS). A computerized building automated equipment control and monitoring system that currently consists of Apogee software and peripheral devices, manufactured by Siemens (formerly Landis and Staefa®), which operate on a Microsoft Windows® NT platform with PC computers used as terminals. The FMCS monitors and detects abnormal conditions in equipment operations. Reference Attachment 2.11.01, Section J, for further information. The FMCS may contain sensitive but unclassified information.

Fire Alarm Systems. Systems that detect fire or fire-related conditions in buildings, structures, equipment, and activation of fire suppression systems. After detection, the system indicates the alarm condition at both local and remote monitoring displays. System includes detectors, building panels and associated wiring, antennas, host computers, local and remote display units, and printers.

Gas Detection Systems. Systems that detect gas conditions in buildings, structures, tanks including underground fuel, and equipment. After detection, the system indicates the alarm condition at both local and remote, or portable monitoring displays. Systems may include detectors, building panels and associated wiring, host computers, and local and remote display units.

Integrated CCTV and Alarm Monitoring Systems. Systems that provide alarm-activated closed circuit television monitoring in buildings and structures. See Paragraph C11.7.A for additional details.

C11.3 GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES

Refer to Section C3.

C11.4 CONTRACTOR FURNISHED ITEMS

Refer to Section C4.

C11.5 FIXED PRICE WORK

The following contract requirements shall be performed per the Performance Requirements Summary (PRS), Attachment 3, Section J, and the performance criteria listed within the contract requirement:

C11.5.A Trouble Calls (TC). The Contractor shall perform all TC related to this section per Section C5.2, Firm Fixed Price Work; Trouble Calls. The response and maintenance criteria for equipment and systems in this section shall be according to the availability requirements stated in Attachment 2.11.02, Section J.

C11.5.B Contract Requirement No. C11-501, Fire Alarm Systems.

Code Compliance Standard(s) – NFPA 72

Attachment(s) – 2.11.02, Section J. Facility Alarm Systems Availability Requirements; 2.11.03, Section J, Fire Alarm Systems Inventory

PM Checklists – C11-501, Section J.

The Contractor shall perform PM in order to maintain system integrity on all fire alarm systems that include, but are not limited to, fire transmitters and various fire panels as listed in Attachment 2.11.03, Section J. All systems shall be maintained according to the availability requirements stated in Attachment 2.11.02, Section J.

C11.5.C Contract Requirement No. C11-502, Gas Detection Systems.

Code Compliance Standard(s) – NFPA, NEC

Attachment(s) – 2.11.01, Section J, Facility Alarm System Codes, Standards, and Regulations; 2.11.05, Section J, Gas Detection Systems

PM Checklists – C11-503, Section J.

The Contractor shall perform PM in order to maintain system integrity on all gas and fuel leak detection systems listed in Attachment 2.11.05, Section J, in accordance with specifications stated in Division 2, Section 16721 Gas Detection Systems of Attachment 2.11.01, Section J. All systems shall be maintained according to the availability requirements stated in Attachment 2.11.02, Section J.

C11.5.D Contract Requirement No. C11-503, FMCS System Operation.

Code Compliance Standard(s) – OEM Standards; EO 12759: Federal Energy Management

Attachment(s) – 2.03.03, Section J, FMCS Hardware Inventory; 2.11.04, Section J, FMCS Inventory; 2.11.02, Section J, FMCS Availability Requirements

PM Checklists – C11-505, Section J.

The Contractor shall provide maintenance, repair, or replacement of all FMCS panels, sensors, actuators, and associated hardware, software, and data. The Government shall provide the host computer, data/visual display terminals and consoles, networks, network

drivers, network terminations, and other associated hardware, but the Contractor shall use the equipment for maintenance work on-site and notify the Government of any problems requiring repairs or replacement. The Contractor shall perform database diagnostics, provide technical engineering support for the FMCS system, and make control program changes due to changes in building occupancy and use. FMCS hardware inventory is shown in Attachment 2.03.03, Section J. FMCS field inventory is shown in Attachment 2.11.04, Section J. Field panels that become inoperative or unable to perform monitoring and control shall be repaired or replaced within eight (8) hours. Panels that operate but are unable to access the network trunk shall be reported to the Government upon discovery. Panels that require software revisions shall be modified, reprogrammed, or upgraded as necessary to meet stated requirements. Sensors that become inoperative, unreliable, or unable to perform its intended function shall be replaced by the Contractor. The FMCS system shall be maintained according to the availability requirements stated in Attachment 2.11.02, Section J.

C11.5.E Contract Requirement No. C11-504, FMCS Monitoring.

Code Compliance Standard(s) – Standard Operating Procedures Manual

Attachment(s) – N/A (Available in the TRL)

PM Checklists – C11-506, Section J.

The Contractor shall provide 24-hour monitoring seven (7) days a week of FMCS alarms status for buildings and equipment via the FMCS system. All alarms shall be treated as a trouble call (TC). Refer to Section C5.2, Firm Fixed Price Work; Trouble Calls, for classification of TC. The Contractor shall respond to all maintenance alarms (MA's) as an urgent TC during regular working hours. After regular working hours, the response time shall be within four (4) hours of the following workday. The Contractor shall respond to all critical alarms (CAs) as a critical TC. The Contractor shall coordinate facility maintenance work with FMCS operations to avoid false alarm generation. The Contractor shall make temporary adjustments and program changes to FMCS controlled systems for maintenance, construction, repair, and research specific project requirements as requested. Document all adjustments and program changes to provide audit trail. Changes shall not be implemented until audit trail is reviewed by the Contractor and authorization is received by the Government. All FMCS standard operating procedures, including changes made under this contract, is Government property, for the exclusive use of the Government, and may not be transferred to another location, in any form, or used by the Contractor for any other purpose except for work performed under this contract.

C11.5.F Contract Requirement No. C11-505, FMCS Engineering.

Code Compliance Standard(s) – Ames Standard Construction Specifications, APD 8829.1, Construction Permits.

Attachment(s) – 2.11.01, Section J, Facility Alarm System Codes, Standards, and Regulations

PM Checklists – C11-507, Section J.

The Contractor shall provide engineering analysis, make modifications to accommodate new and continuous improvements to existing equipment, and make appropriate recommendations to the COTR for all FMCS project related requests and submittals. In addition, the Contractor shall perform design reviews and attend design review meetings for mechanical systems as related to FMCS, electrical systems as related to FMCS, and engineering and design projects that involve building controls and alarm systems using the FMCS. The Contractor shall also create drawings and modify specifications to be included as part of construction bid documents as requested for future maintenance and repair projects. See Attachment 2.11.01, Section J, for information related to the FMCS.

C11.6 DOCUMENTATION AND REPORTING REQUIREMENTS

- C11.6.A Contract Requirement No. C11-601, Monthly Progress Reports. The Contractor shall provide a monthly progress report to the COTR addressing any and all equipment failures, cause of failures, and corrective actions taken. In addition, the Contractor shall include an activity log of all bypasses and restores of alarm systems performed during the month.
- C11.6.B Contract Requirement No. C11-602, Annual FMCS Plan. The Contractor shall document all changes made to the FMCS. The Contractor shall prepare an annual plan of FMCS new and continuous improvement projects to improve comfort, improve performance efficiencies, reduce energy and water consumption, and reduce maintenance costs by use of remote sensing, improved design, making parameter adjustments to gain efficiencies, or use of other technologies. The FMCS plan shall be submitted to the COTR commencing at the beginning of each Government fiscal year.
- C11.6.C Contract Requirement No. C11-603, Incident Report. The Contractor shall provide an incident report via electronic copy to the COTR by 0730 (7:30 AM) the following workday for any alarm notifications received by the FMCS, excluding maintenance alarms that occurred during the previous 24 hours. Events that occur on weekends and holidays shall be provided on the next workday.

C11.7 INDEFINITE DELIVERY INDEFINITE QUANTITY WORK

Indefinite delivery indefinite quantity (IDIQ) work will be ordered in accordance with Section C7, Indefinite Delivery Indefinite Quantity Work, and completed within the number of calendar or workdays specified in the Contract Task Order (CTO). The Craft Hour Unit Price (CHUP) rates will apply to all IDIQ services in this section. Typical services ordered by the Government are shown below in this section.

- C11.7.A Alarm Devices/Systems and Control Panels. The Contractor shall PM or provide and install as a replacement or new component a fire alarm system, security alarm/CCTV system, gas detection system, FMCS device, or control panel per the CTO. The Contractor shall use the latest Government approved equipment and specifications for the job. See Attachment 2.11.01, Section J, for installation of all alarm systems and FMCS.
- C11.7.A.1 Replacement: The Contractor shall remove the existing units and install new alarm device and control panel per the CTO. Adhere to specifications outlined in Attachment 2.11.01, Section J.
- C11.7.A.2 New: The Contractor shall install new alarm device and control panel as specified per the CTO order. Adhere to specifications outlined in Attachment 2.11.01, Section J.
- C11.7.A.3 PM: The Contractor shall perform PM on existing equipment in order to maintain system integrity on access control security systems/CCTV systems that include magnetic card key access systems as specified per the CTO order. Adhere to specifications outlined in Attachment 2.11.01, Section J. All systems shall be maintained according to the availability requirements stated in Attachment 2.11.02, Section J.
- C11.7.B Engineering and Technical Services. The Contractor shall be required to provide engineering and technical services for new FMCS installations. Services shall include, but are not limited to, design review of FMCS submittals, mechanical systems as related to FMCS, and electrical systems as related to FMCS. The Contractor shall perform engineering and design for building control using the FMCS to create drawings, specifications, and construction bid documents.

C11.8 DETAILED SPECIFICATIONS

- C11.8.A Equipment Failure. The Contractor shall maintain all equipment in optimum operating condition and identify to the Government immediately when performance issues for an existing panel is failing or beyond economic repair. All equipment shall be operational, functional, and ready to respond to any alarm situation according to its design purpose and intent 100 percent of the time except for scheduled or planned outages. For unscheduled and unplanned outages, all facility alarm systems under this section shall be down no longer than those occurrences and times specified in Attachment 2.11.02, Section J. System failures over the allowed occurrences per month will be subject to deductions.
- C11.8.B Scheduled Maintenance. Each system shall require appropriate down time for scheduled maintenance. Scheduled maintenance shall last no more than 48 hours during any one (1) scheduled maintenance period. The Contractor shall have no more than four (4) scheduled maintenance periods per type of system in the same location in any one (1) calendar year.
- C11.8.C Codes. The Contractor shall comply with all applicable Federal, State, local, and Original Equipment Manufacturer (OEM) codes, standards, and regulations. Specifications used to procure existing equipment are listed in Attachment 2.11.01, Section J.
- C11.8.D Qualifications. All technicians must be qualified and trained to work on all systems listed in this section in order to keep the systems in operational condition. See Section C1.2.P, General Requirements; Scope of Work; Contractor Licensing, Certification, and Specific Experience Requirements, for qualification requirements required by this section.
- C11.8.E List of Publications. The Contractor shall comply with the latest editions of, but not be limited to, the following publications: 1) ARC developed FMCS Design Support Guide; 2) NASA Facilities Maintenance and Operations Management, NPR 8831.2E; 3) EO 12902; and 4) National Electric Code (NEC); 5) Uniform Building Code (UBC); 6) National Fire Protection Association (NFPA) 70, 72, 1221, inclusive; 7) California Title 24; 8) Factory Mutual (FM); 9) Underwriters' Laboratories (UL) 294,1076.

END OF SECTION C11

SECTION C12**UTILITY SYSTEMS MAINTENANCE AND REPAIR****C12.1 GENERAL REQUIREMENTS**

- C12.1.A General Intention. The Contractor shall provide all labor, supervision, materials, tools, equipment, transportation, and management necessary to provide maintenance and repair to the utility systems, associated mechanical equipment, and surfaced areas at Ames Research Center (ARC) and Moffett Airfield Complex (MAC). In addition, all utility distribution systems at Moffett Housing Annex (MHA) Area 2 shall be included as part of this contract. The work includes, but is not limited to, removing debris from earth drainage ditches and drainage structures such as culverts, manholes, drop inlets, catch basins, gutters, piping, and open ditches and swales; minor repair of underground utility systems (i.e. domestic water, reclaimed water, fire suppression, natural gas, compressed air, storm sewer and sanitary sewer systems); grading of earth, replacement of disturbed landscaping and lawn sprinkler systems; soil-aggregate roadways and shoulders; crack sealing; cutout of pavement for utility repairs; temporary and permanent patching of sections of bituminous (flexible) and concrete (rigid) pavements; and pavement marking. Work shall be performed as Trouble Calls (TC), recurring services per Section C5, Firm Fixed Price Work; Section C7, Indefinite Delivery Indefinite Quantity Work; and comply with the appropriate directives, manuals, and instructions listed in Attachment 2.06.01, Section J.
- C12.1.B Drawings. All drawings and utility maps applicable to this section will be provided to the Contractor that identify locations of all underground utility systems, ditches, roadways, and drainage structures. The Contractor shall check all drawings furnished to the Contractor immediately upon receipt and shall promptly notify the COTR of any discrepancies. The Contractor shall compare all drawings and field verify the maintenance areas and contract quantities before laying out the work and shall be responsible for any avoidable errors. Utility prints shall be "red-lined" as discrepancies are discovered, and submitted to the Government for updating within five (5) working days from when the discrepancy was first noticed.
- C12.1.C Code Requirements. The Contractor shall follow all Federal, State, and local codes and standards while maintaining, repairing, or replacing any utility system here at Moffett Field. All special handling of excavated materials shall be in accordance with Section C20, Environmental and Emergency Support Services.

C12.2 DEFINITIONS

Refer to Section C2.

Clean. Free of dirt, dust, litter, debris, loose particles, foreign objects, residue, and other impurities.

DWV. When referred to in plumbing terms, will mean drain, waste, and vent.

Maintenance Work. Maintenance work includes inspection, servicing, cleaning, repairing, and replacement of the equipment, systems, and their components.

Material Condition. The overall present physical state of a piece of equipment and its associated components with regards to age, appearance, assembly, assessment, evaluation, and appraisal.

Natural Gas System. A natural gas system is that portion of piping that conveys natural gas from the public utility meters throughout Moffett Field to all gas-fired fixtures.

Plumbing System. The plumbing system includes all potable water supply and distribution pipes, including de-ionized water systems, backflow prevention devices, plumbing fixtures, traps, drainage and vent pipes; and all building drains including their respective joints and connections, devices, receptacles, and appurtenances within the building and to a point of five (5) feet outside each building, including potable water piping, gas piping, water heaters, and vents for the same.

Public Sanitary Sewer. A public sanitary sewer system is a common sewer connecting all building drains together and carrying them to a city-owned treatment plant.

Storm Sewer (Drain) System. The storm sewer system consists of building roof leaders, area drains, gutters, catch basins, drop inlets, curb drains, manholes, open culverts, any piping conveying rainwater, and surface water to public tributaries.

Water Main. The water main (street main) is a water supply pipe for public or community use.

Water Supply System. The water supply system of a building or premises consists of the building supply pipe, water distribution pipes, and the necessary connecting pipes, fittings, control valves, and all appurtenances carrying or supplying potable water in, or adjacent to, the building or premises and connected to the water main for supply.

C12.3 GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES

Refer to Section C3.

C12.4 CONTRACTOR FURNISHED ITEMS

Refer to Section C4.

C12.5 FIXED PRICE WORK

The Contractor shall perform the following contract requirements per the Performance Requirements Summary (PRS), Attachment 3, Section J, at frequencies or performance criteria specified within the contract requirement:

C12.5.A Trouble Calls (TC).

- C12.5.A.1 Pavement Cutting and Patching. When issued, sections of bituminous and concrete pavements at specified locations shall be cut out to permit utility investigations and/or repairs. Within one (1) working day following a utility repair, the cut out area shall be backfilled with material similar to the adjacent, undisturbed material, compacted to a similar density, and temporarily patched as specified in Section C9.7.B; Roads and Other Surfaced Areas Maintenance and Repair; IDIQ Work; Temporary Pavement Patching. The Government will grant extension times for completion if the Contractor chooses to apply a more permanent patch as specified in Section C9.7.C; Roads and Other Surfaced Areas Maintenance and Repair; IDIQ Work; Bituminous Pavement Patching or Section C9.7.D; Roads and Other Surfaced Areas Maintenance and Repair; IDIQ Work; Concrete Pavement Patching. Any landscaped areas or pavement markings damaged as a result of this work shall be restored to their original condition.

- C12.5.A.2 Water Main and Natural Gas Leak. When issued a TC for a water main or natural gas leak, the TC shall be classified as an emergency TC according to Section C5.2, Firm Fixed Price Work; Trouble Calls. The NASA Ames Dispatch Office must be kept informed of events as they develop.
- C12.5.A.3 Sanitary and Storm Sewer Stoppages. When issued a TC for a sanitary or storm sewer stoppage during regular working hours, the line must be cleared within a four (4) hour period from initial notification, including clean-up of any spillage. During other than regular working hours, response, blockage removed, and line restored to normal must occur within eight (8) hours. The Contractor shall use an approved disinfectant when applicable. The NASA Ames Dispatch Office must be kept informed of events as they develop.
- C12.5.A.4 Fire Sprinkler System Mechanical Malfunctions. When issued a TC during regular working hours, repairs must be accomplished within an eight (8) hour period and system restored to normal operating condition per proper automatic fire sprinkler system procedures. During other than regular working hours, response, notification, and isolation of malfunction system must occur within one (1) hour. If the system cannot be restored, a request for an hourly fire watch by the NASA Ames Dispatch Office must be implemented until the system is fully operational.
- C12.5.B Contract Requirement No. C12-501, Fire Hydrants.
Code Compliance Standard(s) – NFPA 13, Section 1201, Chapter 18-4.3.
Attachment(s) – 2.12.10, Section J, Fire Hydrants Inventory
PM Checklists – C12-501, Section J.
The Contractor shall perform an annual Preventive Maintenance (PM) on all fire hydrants listed, and shall be accomplished by the uni-directional flushing method. This process requires all the valves within a zone to be closed, then one valve opened in the desired direction of flow out through the nearest fire hydrant to allow for optimal cleaning of the system. This work requires an advance 30 day scheduling notice to be approved by the Plant Engineering Branch. Work shall take place between the months of February through April, and be accomplished on weekends to minimize building usage, plugging fixtures with sediment, and minimizing traffic disruptions due to water flowing onto the street and vehicles being parked on top of water main valves that require flushing.
- C12.5.C Contract Requirement No. C12-502, Water Meters.
Code Compliance Standard(s) – To correctly meter actual usage for billing purposes.
Attachment(s) – 2.08.01, Section J, Meters Inventory; 2.12.16, Section J, Meter PM Inventory
PM Checklists - C12-502, Section J.
The Contractor shall maintain all water meters listed in properly working order. Any meter that is inoperable or indicating false readings shall be repaired or replaced within 15 working days upon the Contractor's discovery or notification by the Government. The Contractor shall perform PM on all meters included in Attachment 2.12.16, Section J. Meter readings shall be in accordance with Contract Requirement No. C8-501, Monthly Meter Readings.
- C12.5.D Contract Requirement No. C12-503, Deluge/Foam Firefighting System.
Code Compliance Standard(s) – NFPA 20, Chapters 11 and 12; NFPA 25, Chapters 5, 10, 11, and 12; NFPA 409, Chapter 11.1; Manufacturer's Recommendations
Attachment(s) – 2.12.17, Section J, Fire Suppression Systems Inventory
PM Checklists – C12-503.A, B, Section J.

The Contractor shall perform PM on all deluge foam firefighting systems including the fire pumps located in the courtyard of Building 221. In addition, the deluge/foam system for Hangars N211 and N248 shall be tested per NFPA 409 every five (5) years.

C12.5.E Contract Requirement No. C12-504, Fire Suppression Wet Pipe System.

Code Compliance Standard(s) – NFPA 25, Chapter 3, Section 3.3.20 and 3.3.36, Chapter 4, Section 4.3, and Chapter 5, Table 5.1

Attachment(s) – 2.12.17, Section J, Fire Suppression Systems Inventory

PM Checklists - C12-504, Section J.

The Contractor shall perform PM on all fire suppression wet pipe systems.

C12.5.F Contract Requirement No. C12-505, Fire Suppression Pre-Action System.

Code Compliance Standard(s) – NFPA 25, Chapters 5 and 12. Actuating means of the valve are described in NFPA 13, Section 3-3.2.1

Attachment(s) – 2.12.17, Section J, Fire Suppression Systems Inventory

PM Checklists - C12-505, Section J.

The Contractor shall perform PM on all fire suppression pre-action systems.

C12.5.G Contract Requirement No. C12-506, Sanitary Sewer Flow Meters and pH Meter.

Code Compliance Standard(s) – Cities of Sunnyvale and Palo Alto, Waste Water Discharge Permits.

Attachment(s) – 2.20.05, Section J, Waste Water Discharge Permits

PM Checklists - C12-506, Section J.

The Contractor shall perform PM on all sanitary sewer flow meters and pH meter. Flow meters and pH meter shall be calibrated as per sewer use ordinance requirements, or as required. Flow meters are located at Buildings 56, 221, and 255, and pH meter is located at Building 255.

C12.5.H Contract Requirement No. C12-507, Grease Traps.

Code Compliance Standard(s) – UPC, Sections 1014.0, and 1014.6.

Attachment(s) – 2.12.07, Section J, Sanitary Sewer System Component Inventory

PM Checklists – C12-507, Section J.

The Contractor shall perform PM on all grease traps listed. The amount of grease removed from the traps shall be documented on a manifest and signed by the designated NASA representative from the environmental office prior to removal of waste off-site for disposal.

C12.5.J Contract Requirement No. C12-508, Emergency Eyewash and Shower Equipment.

Code Compliance Standard(s) - Ames Health and Safety Manual (APR 1700.1) for Ames Procedural Requirements for emergency eyewash and shower equipment maintenance, Chapter 18, Section 18.5.4.

Attachment(s) – 2.12.12, Section J, Emergency Eyewash/Shower Inventory

PM Checklists - C12-508, Section J.

The Contractor shall perform a PM on all emergency shower/eyewash stations listed in the attachment. Self-contained equipment (eyewash, shower or combination) and personal eyewashes shall be inspected and maintained in accordance with the manufacturer's instructions and ANSI Z358.1.

C12.5.K Contract Requirement No. C12-509, Pump.

Code Compliance Standard(s) – Manufacturer's Data.

Attachment(s) – 2.16.05, Section J, Pumps Inventory

PM Checklists - C12-509.A, B, C, D, and E, Section J.

The Contractor shall perform PM on all pumps included in Attachment that are not specifically noted elsewhere.

C12.5.L Contract Requirement No. C12-510, Sewage Lift Station Sump Pumps.

Code Compliance Standard(s) – Manufacturer's Data.

Attachment(s) – 2.16.05, Section J, Pumps Inventory

PM Checklists - C12-510.A, B, Section J.

The Contractor shall perform PM on all sewage lift station sump pumps included in Attachment to be in good working order 100 percent of the time.

C12.5.M Contract Requirement No. C12-511, Barminutor.

Code Compliance Standard(s) – Manufacturer's Data.

Attachment(s) – 2.12.07, Section J, Sanitary Sewer System Component Inventory

PM Checklists - C12-511, Section J.

The Contractor shall perform PM on the two sewage lift station barminutors at the main sewage outflow area, Facility 56. Barminutors shall be in good working order 100 percent of the time.

C12.5.N Contract Requirement No. C12-512, Main Natural Gas Regulators.

Code Compliance Standard(s) – Manufacturer's Data

Attachment(s) – 2.12.05, Section J, Natural Gas System Component Inventory

PM Checklists - C12-512, Section J.

The Contractor shall perform PM on all main natural gas regulators listed in Attachment.

C12.5.P Contract Requirement No. C12-513, Storm Drainage System.

Code Compliance Standard(s) – Section C20, Environmental and Emergency Support Services.

Attachment(s) – 2.12.09, Section J, Storm Drainage System Component Inventory

PM Checklists - C12-513.A, B, Section J.

The Contractor shall clear and remove all debris and sediment from the surface of, and up to 15 feet beyond, each end of all drainage structures including culverts, pipes, gutters, catch basins, and drop inlets. All debris and isolated locations of sediment shall be removed from all roadside ditches and ditches and swales bordering or traversing ARC and MAC grounds where severe erosion has interrupted the flow of water. All debris and sediment shall be disposed of in accordance with Section C20. In addition, repair or replace all damaged or deteriorated grates and covers to be in good condition for its intended design use for the given location.

C12.5.Q Contract Requirement No. C12-514, Ground Level Water Tank.

Code Compliance Standard(s) – NFPA 20, Manufacturer's Data.

Attachment(s) – N/A

PM Checklists - C12-514, Section J.

The Contractor shall perform a semi-annual PM on the pressure transmitter and digital indicator electronic controls for the ground level water tank located in the courtyard area of Building 221. The equipment shall be calibrated as required. Instruction manuals will be provided. In addition, the Contractor shall change the filters on the altitude valve for the ground level tank.

C12.5.R Contract Requirement No. C12-515, Water Heaters.

Code Compliance Standard(s) – Ames Legionella Manual dated April 2005, Sections 2.4.2, 2.4.3, and 2.4.5.2.

Attachment(s) – 2.12.20, Section J, Hot Water Heaters Inventory

PM Checklists - C12-515.A, B, C, Section J.

The Contractor shall perform an annual PM on all electric, gas, and steam water heaters 40 gallons or larger included in Attachment 2.12.20, Section J.

C12.5.S Contract Requirement No. C12-516, Storm Drain Markings.

Code Compliance Standard(s) – Santa Clara Valley Urban Run-Off Pollution Prevention Program.

Attachment(s) – 2.12.18, Section J, Storm Drain Stencil

PM Checklists - C12-516, Section J.

The Contractor shall maintain all markings to the storm drain inlets that say “NO DUMPING FLOWS TO BAY”. Stencil shall be legible, have clearly defined edges to all letters, shall not have a faded visual appearance that is difficult to read, and shall not be covered by dirt, debris, or landscape materials. Sample stencil picture and button marking is included in Attachment 2.12.18, Section J. The Government will provide a template used for this stencil.

C12.5.T Contract Requirement No. C12-517, Dye Testing.

Code Compliance Standard(s) – As Applicable per local ordinance.

Attachment(s) – N/A

PM Checklists - C12-517, Section J.

The Contractor shall conduct dye testing when requested to locate illicit connections to the storm drain system. Approximately 25 tests will be required per year at various locations on Center.

C12.5.U Contract Requirement No. C12-518, Kitchen Hood, Duct, and Appliance Fire Protection System.

Code Compliance Standard(s) – NFPA 17A

Attachment(s) – 2.12.19, Section J, Kitchen Hoods and Ducts Inventory

PM Checklists - C12-518, Section J.

The Contractor shall perform PM on the fire protection systems that are a part of kitchen hoods, ducts, and appliances per code requirements.

C12.5.V Contract Requirement No. C12-519, Backflow Prevention Devices.

Code Compliance Standard(s) – ANSI A112.14.1-75, backflow valves; and USC Manual Ninth Edition, Foundation For Cross-Connection Control and Hydraulic Research.

Attachment(s) – 2.12.15, Section J, Backflow Prevention Devices Inventory

PM Checklists - C12-519, Section J.

The Contractor shall perform PM on all backflow prevention devices shown in Attachment. Work shall be accomplished by a certified tester licensed by AWWA to certify backflow devices. Backflow prevention devices that fail certification shall be brought to the attention of the COTR immediately. Repairs and re-certifications shall be ordered and accomplished within 60 calendar days from failure date under Section C7; Indefinite Delivery Indefinite Quantity Work.

C12.5.W Contract Requirement No. C12-520, Water Main Pressure Reducing Valves.

Code Compliance Standard(s) – Manufacturer's Data

Attachment(s) – 2.12.03, Section J, Water Distribution System Component Inventory

PM Checklists – C12-520, Section J.

The Contractor shall perform PM on all water main pressure reducing valves and associated strainers.

C12.5.X Contract Requirement No. C12-521, Lockheed Irrigation Canal.

Code Compliance Standard(s) – Permit For Encroachment, City of Sunnyvale.

Attachment(s) – N/A

PM Checklists – C12-521, Section J.

The Contractor shall perform PM on the 36-inch irrigation canal gate valve located between the Moffett and Lockheed drainage ditches.

C12.5.Y Contract Requirement No. C12-522, Reverse Osmosis System.

Code Compliance Standard(s) – Manufacturer's Data

Attachment(s) – N/A

PM Checklists – C12-522, Section J.

The Contractor shall perform PM on the mobile reverse osmosis system located in the yard next to Building 250-B.

C12.5.Z Contract Requirement No. C12-523, Storm Water Pre-Treatment System.

Code Compliance Standard(s) – Manufacturer's Data

Attachment(s) – N/A

PM Checklists – C12-523, Section J.

The Contractor shall perform annual PM on the two storm water pre-treatment systems located at NA 292 and south end of Marriage Road ditch.

C12.6 DOCUMENTATION AND REPORTING REQUIREMENTS

C12.6.A Contract Requirement No. C12-601, Fire Hydrant Annual Inspection Report. The Contractor shall submit an annual fire hydrant inspection report to the COTR containing, as a minimum, the following information: Reporting period, fire hydrant number, fire hydrant location, date flow tested, gallons per minute (GPM), date flushed, material condition, manufacture date, and fire hydrant style. A sample report is shown in Attachment 2.12.11, Section J.

C12.6.B Contract Requirement No. C12-602, Automatic Fire Sprinkler System Quarterly Inspection Report. The Contractor shall submit a quarterly automatic fire sprinkler system inspection report to the COTR containing, as a minimum, the following information: Reporting period,

building number, system status, alarm number, ID Number, system type, inspection date, annual flow alarm date, modifications and repairs performed, system deficiencies, modifications in progress, technician performing inspection with signature. A sample report is shown in Attachment 2.12.14, Section J.

- C12.6.C Contract Requirement No. C12-603, Calibration Report. The Contractor shall submit a semi-annual calibration report to the COTR for all the sanitary sewer flow meters, and pressure transmitters and digital indicator electronic controls for the ground level water tank located in the courtyard area of Building 221. The semi-annual calibration report is due every June and December of each calendar year. The report shall contain, as a minimum, the following information: ID Number, location, equipment description, test equipment used, before and after calibration input and output, signature of technician with company name and address listed, date performed, and any remarks.
- C12.6.D Contract Requirement No. C12-604, Emergency Shower/Eyewash Inspection Report. The Contractor shall submit a monthly report to the COTR on the emergency shower/eyewash stations. The report shall contain, as a minimum, the following information: ID Number, Building Number, equipment description, date flushed, material condition, volume of water flushed, and status. A sample report is shown in Attachment 2.12.13, Section J.
- C12.6.E Contract Requirement No. C12-605, Water Heaters Annual Report. The Contractor shall submit an annual report (2 copies) to the COTR on all water heaters. The report shall contain, as a minimum, the following information: ID Number, location, equipment description, capacity, type, material condition, last PM date, and status.
- C12.6.F Contract Requirement No. C12-606, Backflow Prevention Devices Inspection Report. The Contractor shall submit an annual report (2 copies) to the COTR on the backflow prevention devices. The report shall contain, as a minimum, the following information: ID Number, location, equipment description, date tested, tester name and license number, material condition, and status.
- C12.6.G Contract Requirement No. C12-607, Grease Trap Report. The Contractor shall submit a quarterly report (2 copies) to the COTR on all grease traps. The report shall contain, as a minimum, the following information: ID Number, Building Number, equipment description, date PMs were performed during the quarter, material condition, and quantity of material removed per trap.

C12.7 INDEFINITE DELIVERY INDEFINITE QUANTITY WORK

Indefinite delivery indefinite quantity (IDIQ) work will be ordered in accordance with Section C7, Indefinite Delivery Indefinite Quantity Work, and completed within the number of calendar or workdays specified in the Contract Task Order (CTO). The Craft Hour Unit Price (CHUP) rates will apply to all IDIQ services in this section. Typical services ordered by the Government are shown below in this section.

- C12.7.A Underground Water Valve Replacement. The Contractor shall remove existing valve at specified location and replace with new AWWA gate valves resilient wedge type with two (2) inch operating nut. Work shall include excavation, any encasements, and repair of all existing conditions. All nuts and bolts are to be stainless steel. Tar-coat existing nuts and bolts on new valve and provide adequate support without compromising maintainability.
- C12.7.B New Underground Water Valve Installation. The Contractor shall install new AWWA gate valve resilient wedge type or butterfly valve with two (2) inch operating nut at specified location. Work shall include excavation and repair of all existing conditions. All nuts and bolts are to be stainless steel. Tar-coat existing nuts and bolts on new valve and provide adequate support without compromising maintainability.

- C12.7.C Aboveground Water Valve Replacement. New aboveground water valves at specified locations shall be added or existing valves replaced with new gate valves or butterfly valves in compliance with UPC, Section 605.1, 605.2, and 605.5.
- C12.7.D New Aboveground Water Valve Installation. New aboveground water valves at specified locations shall be added or existing valves replaced with new gate valves or butterfly valves in compliance with UPC, Section 605.1, 605.2, and 605.5.
- C12.7.E Underground Natural Gas Valve Replacement. New underground gas valves at specified locations shall be added or existing valves replaced with new PE gas valves, DeZurik Series 400 eccentric valves, as applicable, or an equivalent valve that meets ANSI 125 pound standards. Work shall include excavation and repair of all existing conditions.
- C12.7.F New Underground Natural Gas Valve Installation. New underground gas valves at specified locations shall be added or existing valves replaced with new PE gas valves, DeZurik Series 400 eccentric valves, as applicable, or an equivalent valve that meets ANSI 125 pound standards. Work shall include excavation and repair of all existing conditions.
- C12.7.G Aboveground Natural Gas Valve Replacement. New aboveground gas valves at specified locations shall be added or existing valves replaced with new gas valves, DeZurik Series 400 eccentric valves, as applicable, or an equivalent valve that meets ANSI 125 pound standards.
- C12.7.H New Aboveground Natural Gas Valve Installation. New aboveground gas valves at specified locations shall be added or existing valves replaced with new gas valves, DeZurik Series 400 eccentric valves, as applicable, or an equivalent valve that meets ANSI 125 pound standards.
- C12.7.J Underground Domestic Water Piping System. Underground domestic water system at specified locations shall be replaced with new pipe of the same size. Work shall include excavation and repair of all existing conditions. Locations may extend beyond the perimeter fence line at Moffett Field for water mains to the San Francisco Water District connection points at Stevens Creek, Tyrella Station, and Sunnyvale Golf Course. Types of pipe shall be: cement lined ductile iron or copper. All piping shall be designed for water mains with 125 pounds working pressure. Copper pipe and fittings shall be silver soldered.
- C12.7.K Aboveground Domestic Water Piping System. Aboveground domestic water system at specified locations shall be replaced with new pipe of the same size. Locations may extend beyond the perimeter fence line at Moffett Field for water mains to the San Francisco Water District connection points at Stevens Creek, Tyrella Station, and Sunnyvale Golf Course. Types of pipe shall be: cement lined ductile iron, or copper. All piping shall be designed for water mains with 200 pounds working pressure.
- C12.7.L Underground Fire Sprinkler Piping System. Underground fire sprinkler mains at specified locations shall be replaced with new pipe of the same size. Types of pipe shall be: cement lined ductile iron or copper. All piping shall be designed for fire sprinkler mains with 150 pounds working pressure. Copper pipe and fittings shall be silver soldered. Work shall include excavation and repair of all existing conditions.
- C12.7.M Aboveground Fire Sprinkler Piping System. Aboveground fire sprinkler mains at specified locations shall be added or existing piping replaced with new pipe of the same size. Types of pipe shall be: steel (Groove Lock or equal), cement lined ductile iron, or copper. All piping shall be designed for fire sprinkler mains with 150 pounds working pressure.
- C12.7.N Underground Natural Gas Piping System. Underground natural gas piping at specified locations shall be replaced with new pipe of the same size. Types of pipe shall be PE or steel in accordance with the NASA Master Specs in Tact Section 15489. Work shall include excavation and repair of all existing conditions. All PE piping shall have a solid copper tracer wire attached the full length of pipe, terminating in each valve box.

- C12.7.P Aboveground Natural Gas Piping System. Aboveground natural gas piping at specified locations shall be replaced with new pipe of the same size. Pipe shall be steel in accordance with the NASA Master Specs in Tact Section 15489.
- C12.7.Q Underground Sanitary Sewer Piping System. Underground sanitary sewer piping at specified locations shall be replaced with new pipe of the same size. Types of pipe shall be cast iron, copper, brass, Schedule 40 ABS DWV, Schedule 40 PVC DWV, polyethylene, and RCP.
- C12.7.R Underground Storm Drain Piping System. Underground storm drain piping at specified locations shall be replaced with new pipe of the same size. Types of pipe shall be cast iron, copper, brass, Schedule 40 ABS DWV, Schedule 40 PVC DWV, polyethylene, and RCP.
- C12.7.S Underground Sanitary Sewer and Storm Drain Manholes. Underground sanitary sewer and storm drain manholes at specified locations shall be replaced with a new manhole of approximately the same size as existing manhole to be replaced. The new manhole shall be made from the latest trade approved materials.
- C12.7.T Natural Gas Regulators. Natural gas regulators at specified locations shall be added, adjusted to meet designated output, or existing regulators replaced with new regulators of the appropriate size and style. The new regulator shall conform to the NASA Master Specs in Tact for natural gas systems Section 15489. Recommended type to keep uniformity is the Fisher® series 298.
- C12.7.U Natural Gas Pipe Sleeving. Underground natural gas piping shall be sleeved inside existing pipe with new PE gas pipe at specified locations. All PE fittings and joints shall be joined by a qualified person in heat fusion joining using the heat fusion method. Follow CFR Title 49, Section 192.285 for qualifications.
- C12.7.V Water Main Pressure Reducing Valves. Water main pressure reducing valves at specified locations shall be added, adjusted to meet designated output, or existing valves replaced with Bailey® No. 428 or equal type valves. Valves must be compatible with existing domestic water main system.
- C12.7.W Water and Natural Gas Meters. Water meters at specified locations shall be added with Badger® Recordall compound and combo series, or equal type meter. Natural gas meters at specified locations shall be added with American® GTS series, or equal type meter. Meters must be compatible with existing domestic water main system or natural gas system.
- C12.7.X Water Heaters. Water heaters at specified locations shall be replaced with a commercial type energy efficient heater compatible with existing system. Heaters shall be equipped with a non-metallic corrosion proof drain valve and/or clean-out, and outer insulating jacket. Gas heaters shall meet the requirements for NOx emissions per the latest BAAQMD regulations.
- C12.7.Y Backflow Prevention Devices. Backflow prevention devices at specified locations shall be replaced with like kind and size or installed at new location required by code to protect potable water system. Devices shall be certified by tester licensed by AWWA to certify backflow devices.
- C12.7.Z CO2 Systems, Buildings 3 and 235. The CO2 System at Buildings 3 and 235 shall be maintained, and shall comply with all National Fire Codes. Examples include the following: (1) weigh cylinders; (2) recharge cylinders; (3) check fusible links at each zone; (4) provide documentation of such action; and (5) keep records of documentation on file for the contract period.

C12.8 DETAILED SPECIFICATIONS

C12.8.A Calibration. Upon successful completion of calibration, the Contractor shall affix a sticker to all equipment indicating the next calibration due date.

END OF SECTION C12

SECTION C13**BUILDINGS AND STRUCTURES MAINTENANCE, REPAIRS AND ALTERATIONS****C13.1 GENERAL REQUIREMENTS**

General Intention. The Contractor shall provide all labor, management, supervision, tools, materials, equipment, incidental engineering, and transportation to perform maintenance, repair, alterations, and inspections on buildings, structures, and equipment at Ames Research Center (ARC) and Moffett Airfield Complex (MAC). Buildings, structures, and equipment to be maintained are described in Attachments 2.05.01 and 2.05.02, Section J. The fixed price work is shown in Paragraph C13.5 below. All other work shall be performed as incidental recurring services work including TC and PM, and Indefinite Delivery Indefinite Quantity (IDIQ) work items.

C13.2 DEFINITIONS

Refer to Section C2.

Clean. The term “clean” as referred to in this section means: free of all dust, dirt, corrosion, grease, oil, grime, and foreign matter to a bare surface leaving no injurious effects.

C13.3 GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES

Refer to Section C3.

Ames Standard Construction Specifications, latest edition.

The Government will furnish to the Contractor survey data contained in a roofing database and a computer software application in which the data and AutoCAD drawings reside. See Attachment 2.13.03, Section J, for details on the Government supplied roofing software.

C13.4 CONTRACTOR FURNISHED ITEMS

Refer to Section C4.

C13.5 FIXED PRICE WORK

The following Contract Requirements shall be performed per the Performance Requirements Summary (PRS) Attachment 3, Section J, at the frequencies or performance criteria specified within the contract requirement:

C13.5.A Trouble Calls (TC).

C13.5.A.1 The Contractor shall respond, repair, and document roof related TC in the following manner:

C13.5.A.1.a The Contractor shall protect building interior, furnishings, equipment, and personnel by safely containing incoming water as soon as practicable, but no later than 24 hours after initial contact.

- C13.5.A.1.b The Contractor shall identify the compromised area(s) visually and/or with infrared scan and perform the appropriate temporary repair or alteration within 48 hours of notification. Refer to Paragraph C13.8.H, Roofing, for repair methods.
- C13.5.A.1.c The Contractor shall revisit all temporary repairs when conditions allow for the installation of a permanent repair. Refer to Paragraph C13.8.H, Roofing.
- C13.5.A.1.d Document the cause and exact location of roof leak on the TC form. In addition, the Contractor shall be responsible for updating the existing roofing database (and associated AutoCAD drawings) to include any TC work performed on a roof including any photographs or infrared scans of compromised areas. The Government shall provide all existing software and survey data at the start of the Base Period. See Contract Requirement No. C13-601, Roof Documentation.
- C13.5.A.2 The Contractor shall respond to all other building and structure related TC per Section C5.2, Firm Fixed Price Work, Trouble Calls. The Contractor shall provide all maintenance, repairs, and alterations as identified in Paragraph C13.8, Detailed Specifications, in accordance with Federal, State, and local regulations and codes, including historic preservation requirements. Services not identified in the detailed specifications paragraph shall be in accordance with normal industry standards.
- C13.5.B Contract Requirement No. C13-501, Roof Inspections.
Code Compliance Standard(s) – NASA Standard
Attachment(s) – 2.13.01, Section J, Roofs Inventory
PM Checklists – C13-501, Section J.
The Contractor shall perform roof inspections on building roofs listed in Attachment 2.13.01, Section J. Buildings shall be inspected on a three (3) year schedule with one-third (1/3) inspected each year. The first year's schedule shall include those buildings on the priority listing from the Micro ROOFER software database at the start of the Base Period. At the start of the Base Period, the Government will furnish all existing software and survey data (including infrared and visual inspection data) of the roofs. The inspection criteria shall include all elements of maintenance to protect the facilities from leaks, and to preserve the condition of the roof and prevent it from further degradation. The inspection shall include all elements of roofing, flashing, coping, gravel stops, pitch pockets, penetrations, drains, and caulking. The information obtained from the roof inspections shall be used to update the Micro ROOFER software database and drawings. The Contractor shall fill in all data fields required by the software for each roof inspection.
- C13.5.C Contract Requirement No. C13-502, Facility Condition Assessment.
Code Compliance Standard(s) – NASA Standard
Attachment(s) – 2.13.04, Facility Condition Assessment Report Sample
PM Checklists – C13-502, Section J.
The Contractor shall conduct a standardized facility condition assessment on all facilities listed in Attachment 2.01.04, Section J, for the purpose of observing, recording, and recommending fixes to restore each facility to its original state. Facilities shall be inspected on a three (3) year schedule with one-third (1/3) inspected each year. The Contractor shall assess the condition of each facility in order to determine the overall average condition of the Center. Data from other surveys and reports shall be factored into the assessment of each facility condition. The surveys will encompass the different components of the facilities such as, but not limited to, roofs, pumps, air conditioning, interior finishes, and electrical devices and systems. They also include the Center's infrastructure, such as, but not limited to, roads, storage tanks, grounds, sidewalks, drainage structures, and utility systems. These assessments will insure 80 percent accuracy of the backlog of maintenance and repairs

(BMAR) at all times and shall include a cost estimate for corrections of any deficiencies discovered or replacement of equipment. The Contractor's facility condition assessment records shall be available to the Government at all times.

C13.5.D Contract Requirement No. C13-503, Roof Drains and Gutters.

Code Compliance Standard(s) – NASA Standard

Attachment(s) – 2.13.01, Roofs Inventory

PM Checklists – C13-503, Section J.

The Contractor shall clean out all roof drains and surrounding 10-foot area plus any gutters on an annual basis. See Attachment 2.13.01, Section J, for list of roofs where drains are located. Drains and gutters shall be free flowing and clear of all obstructions and blockages. Drain caps and strainers shall be cleaned out of all debris and placed back into its proper position. The Contractor shall replace or repair any damaged or missing caps, strainers, and ancillary components. Work shall be scheduled during the fall prior to heavy rains.

C13.5.E Contract Requirement No. C13-504, Emergency Exit Lighting.

Code Compliance Standard(s) – NFPA 70; NFPA 101, Chapter 7.9

Attachment(s) – 2.13.02, Section J, Emergency Lighted and Exit Signage Inventory

PM Checklists – C13-504, Section J.

The Contractor shall maintain all emergency exit lighting and lighted exit signage in operational status at all times. The Contractor shall test all back-up battery systems to be functional for specified time limit stated in NFPA 101, Chapter 7.9.3.1, and illumination performance shall be in accordance with NFPA 101, Chapter 7.9.2. Written records of visual inspections, tests, and readings shall be documented. See Attachment 2.13.02, Section J, for lighting inventory.

C13.5.F Contract Requirement No. C13-505, Locksmith Services.

Code Compliance Standard(s) – NASA Security Requirements, HSPD-12

Attachment(s) – Current workload is one (1) FTE

PM Checklists – N/A

The Contractor shall provide locksmith services to support activities at Moffett Field. Locksmith services involve installation, removal, and maintenance of locking devices and tumblers on doors, re-keying locks in event of lost keys for office doors, keyed entryways, furniture items or equipment, opening safes and any other security containers/barriers, and resetting combinations. The Contractor shall work closely with NASA's Plant Engineering Branch and Protective Services Office for maintenance work involving all Government cores.

C13.5.G Contract Requirement No. C13-506, OMFIT Support.

Code Compliance Standard(s) – NASA OMFIT Charter

Attachment(s) – 2.13.06, Section J, OMFIT Charter; 2.13.07, Section J, Sustainability Checklist

PM Checklists – N/A

The Contractor shall provide support to the NASA Operations and Maintenance of Facilities Innovations Team (OMFIT). Support shall include attending monthly meetings on-site via video-teleconference, providing written documentation to committee members including updating the yearly OMFIT sustainability checklist shown in Attachment 2.13.07, Section J, and attending up to two off-site meetings occurring around the country usually at another NASA location site.

C13.6 DOCUMENTATION AND REPORTING REQUIREMENTS

- C13.6.A Contract Requirement No. C13-601, Roof Documentation. The Contractor shall document in Micro ROOFER all changes regardless of who performed the work that affects the condition of the roofs on facilities listed in Attachment 2.13.01, Section J. Changes to the database and drawings shall be made within ten (10) working days following completion of the roof work or when notified by the Government. The database shall be backed up on a daily basis on an independent system to prevent loss of data. The Government may at any time access the database and review the information contained therein. The database, including changes made under this contract, is Government property, for the exclusive use of the Government, and may not be transferred to another location, in any form, or used by the Contractor for any other purpose except for work performed under this contract.
- C13.6.B Contract Requirement No. C13-602, Facility Condition Assessment Report. The Contractor shall provide five (5) hard copies and one (1) electronic copy of the Facility Condition Assessment Report to the COTR on a semi-annual basis. The report shall contain recommendation of future projects for Government consideration in initiating capital investment projects. The recommendations shall include a full description of the work as well as a preliminary project cost estimate for each project proposed. A sample of this report is shown in Attachment 2.13.04, Section J.
- C13.6.C Contract Requirement No. C13-603, Monthly Roofing Report. The Contractor shall provide a monthly electronic report to the COTR of all roofs inspected each month. The report shall identify all problems, fixes, and deficiencies discovered. The report shall also include all roof related TC data, Micro ROOFER section inventory reports, photographs, and any associated AutoCAD drawings. A sample of this report is shown in Attachment 2.13.05, Section J.
- C13.6.D Contract Requirement No. C13-604, Annual Paint Usage Report. The Contractor shall keep continuous records of all paint types used and amounts applied for all applications under this contract. The Contractor shall provide one (1) hardcopy and one (1) electronic copy to the COTR annually.
- C13.6.E Contract Requirement No. C13-605, Building Maintenance, Repair, and Cost Profiles Report. The Contractor shall provide (3) hard copies and one (1) electronic copy of the Building Maintenance, Repair, and Cost Profiles Report to the COTR on an annual basis. Annualized Cost summaries based on actual labor hours for maintenance and repair work shall include three (3) categories; scheduled M&R (e.g. PMs), unscheduled M&R (e.g. TCs), and IDIQ work to arrive at a cost per square foot for up to 80 NASA owned and occupied facilities based on gross square footage size ranging from 175,000 sq ft down to 2000 sq ft. Annualized cost summaries for each building operational profile shall include the M&R work, grounds maintenance, pest control, energy, road clearance, and water/sewer. Multiplier and utility rates will be provided by the Government each year. See Whitestone Research Corporation (www.whitestoneresearch.com) for sample format similarity.

C13.7 INDEFINITE DELIVERY INDEFINITE QUANTITY WORK

Indefinite delivery indefinite quantity (IDIQ) work will be ordered in accordance with Section C7, Indefinite Delivery Indefinite Quantity Work, and may be ordered for any facility or area at ARC and MAC. Maintenance, repair, or minor construction IDIQ work shall be completed within the number of days specified on the Contract Task Order (CTO). The Craft Hour Unit Price (CHUP) rates will apply to all IDIQ services in this section. Typical services ordered by the Government are shown below in this section.

- C13.7.A Roof Repairs. The Contractor shall repair roofs per Paragraph C13.8.H, Roofing.

- C13.7.B Roof Core Sample. The Contractor shall remove a two (2) inch diameter core sample of all roofing layers down to, but not including, the hard deck. The hole shall be filled and patched appropriately. The core sample shall be placed inside a sealed plastic bag and given to NASA for investigation.
- C13.7.C Locks. The Contractor shall purchase and install new locks to the following items.
- C13.7.C.1 Desk Drawer. The Contractor shall install new desk drawer locks and/or provide keys necessary to operate locking mechanism.
- C13.7.C.2 Cabinets. The Contractor shall install new cabinet locks and/or provide keys necessary to operate locking mechanism.
- C13.7.C.3 Door Lock. The Contractor shall replace existing door hardware with new or add new door hardware as requested. Work shall include customer training necessary to operate locking mechanism. Government cores shall be supplied and installed by the NASA Locksmith, but the Contractor shall coordinate lock activities with the NASA Locksmith office. All documentation shall be consistent with NASA Security procedures.
- C13.7.C.4 Combination Door Lock. The Contractor shall replace existing door combination lock with new combination door lock or add new combination door hardware as requested including programming access codes. Work shall include customer training necessary to operate locking mechanism. Government cores shall be supplied and installed by the NASA Locksmith, but the Contractor shall coordinate lock activities with the NASA Locksmith office. All documentation shall be consistent with NASA Security procedures.
- C13.7.C.5 Door Closure and Stop Hardware. The Contractor shall replace existing door closure and stop hardware with new or add new door closure and stop hardware as requested.
- C13.7.C.6 Door Hooks. The Contractor shall replace existing hardware with new or add new hardware as requested.
- C13.7.C.7 Door Electronic Access. The Contractor shall install new electronic door access hardware to meet current specifications for ADA and Security access.
- C13.7.D Boxes, Crates, and Carts. The Contractor shall fabricate per Paragraph C13.8.A.9, Boxes, Crates, and Carts.
- C13.7.E Building Plumbing. The Contractor shall repair, replace, or modify water lines, drain lines, and all building fixtures per Paragraph C13.8.E, Plumbing.
- C13.7.F Painting. The Contractor shall paint per Paragraph C13.8.D, Painting.
- C13.7.G Building Electrical. The Contractor shall be responsible for repairing, replacing, or modifying building electrical and electrical components work per Paragraph C13.8.G, Electrical.

C13.8 DETAILED SPECIFICATIONS

- C13.8.A Carpentry and Masonry. The Contractor shall repair and replace carpentry and masonry portions of buildings, structures, and facilities, including all floor, wall, ceiling, and roof construction, building finishes, door hardware, foundations, waterproofing seals, and flashing not included in other sections of this contract. Interior and exterior finishes, trim, and decor shall be maintained to match existing. Loose items shall be re-secured by tightening or

replacing screws, or by using a suitable adhesive. Damaged or missing items shall be replaced with items matching the original. Replacement hardware shall conform to the Building Hardware Manufacturer's Association (BHMA) Product Standard. Hardware items requiring lubrication shall be lubricated and restored to an operable condition. Repairable rusted metal components shall be cleaned of all rust, coated with a rust inhibitor, and restored to an operational condition. The Contractor shall also be responsible for structural alterations and equipment installations that include, but are not limited to:

- C13.8.A.1 Floors and Floor Coverings. Damaged or deteriorated flooring, subflooring, and structural members shall be repaired or replaced to provide a structurally sound, uniform, and aesthetic surface which is free of cracks, breaks, chips, tears, gouges, stains, and buckling. The Contractor shall inspect exposed portions of subfloor during repair or replacement activity. Any evidence of structural damage or deterioration shall be immediately reported to the COTR before proceeding. Some flooring material, baseboard, or adhesive may contain asbestos, which will require special handling and disposal in accordance with Section C20, Environmental and Emergency Support Services.
- C13.8.A.1.a Resilient Tiles. Damaged or deteriorated tiles shall be replaced with matching tiles of the same thickness as original. Damaged tiles or tiles to be replaced shall be removed without affecting adjacent tiles. The affected area shall be cleared of all debris and moisture to provide a clean, uniform, dry surface for the installation of new tile. Installation shall be in accordance with manufacturer's instructions. Upon completion, the entire floor shall be thoroughly cleaned and waxed to provide a uniform surface.
- C13.8.A.1.b Linoleum and Vinyl Sheet Flooring. Areas of flooring having deep gashes or other defects shall be replaced with matching sheet flooring of the same thickness as the original. A replacement section matching existing flooring which is cut larger than the damaged area shall be taped over the defect such that the decorative flooring pattern is continuous, or the replacement section shall be cut back to the original seam. To ensure a properly fitting patch, the Contractor shall cut through both layers of vinyl around the damaged area. The patch and the section of damaged flooring shall be removed and the underlying surface shall be cleaned of all moisture, adhesive, and debris. The patch shall be installed as recommended by the flooring manufacturer. Loose flooring shall be re-secured using an adhesive recommended by the flooring manufacturer. Upon completion, the entire floor shall be thoroughly cleaned and waxed to provide a uniform surface.
- C13.8.A.1.c Finished Wood Flooring. Loose or slightly warped flooring shall be secured with screw-type flooring nails driven at a 45 to 50 degree angle. These nails shall be set and filled with wood putty. Scarred flooring that has holes and gashes less than 1/2 inch wide shall be filled and stained. All other damaged flooring shall be removed and replaced without damage to adjacent walls or flooring. Defects in concrete slab subfloors, such as rough or scaling areas or high/low spots shall be corrected. Damaged wood subflooring shall be removed and replaced with new exterior grade plywood. The subfloor shall be covered with a layer of 15-pound asphalt saturated felt lapped four (4) inches at edges and ends. The replacement flooring shall be of the same quality, type, and species as the existing flooring. The replacement flooring shall be nailed with screw-type flooring nails and be blind nailed at an angle of 45 to 50 degrees or top nailed vertically using pilot holes where necessary to prevent splitting. Where possible, nails shall be driven into supporting floor joists. Nail heads shall be set and filled. All flooring shall fit tightly, without gaps. Replacement flooring or damaged flooring that requires touch-up refinishing shall be sanded smooth and swept

clean. One (1) coat of wood paste filler shall be applied and allowed to fully dry and then two (2) coats of varnish shall be applied.

- C13.8.A.1.d Carpeted Flooring. Repair damaged carpet, replace or install transition strips, tighten loose carpeting, repair seams, and other related items as required to match or fix existing carpeting. Complete room carpet replacement is not a part of the fixed priced portion of this contract.
- C13.8.A.1.e Concrete Floors. Cracked, broken, or spalled areas shall be patched with a non-shrinking cement mortar. Areas shall be cleaned and all loose concrete removed. Underlying surfaces shall be chipped to ensure bond with the patch. Shallow spalled areas shall be chipped to provide space for an adequate patch thickness. The patch shall be finished even with the adjacent surfaces and finished to match existing texture.
- C13.8.A.1.f Vinyl Baseboards. Deteriorated or damaged sections of vinyl baseboard shall be removed. Wall and floor surfaces shall be cleaned of all dirt, oil, grease, mildew, moisture, adhesives, and debris. Loose baseboards shall be re-secured to the wall. Damaged, deteriorated, or missing baseboard sections shall be replaced with an adhesive that conforms to the manufacturer's recommendations.
- C13.8.A.1.g Ceramic Tile. Ceramic tile floors that are broken, missing, cracked, or discolored shall be replaced as required. Floor tiles shall be re-grouted to provide a waterproof seal. When replacement tiles of an exact match cannot be found, the Contractor shall remove and replace non-defective tiles to create a pattern and minimize the visual effect of the mismatch.
- C13.8.A.2 Interior Walls, Ceilings, and Trim. Damaged and deteriorated walls, ceilings, and related trim shall be repaired or replaced to provide a surface which is free of noticeable cracks, spalls, raised areas, holes, dents, marks, and stains to match the surrounding surfaces. Wood trim items and ceiling fixtures shall be removed as necessary to provide access to the damaged area. Upon completion of the repair activity, fixtures and trim shall be reinstalled, nails set, filled, and items repainted or refinished to restore them to their original condition. When removing wall or ceiling coverings, the Contractor shall inspect the supporting structural system and notify the COTR immediately of any need for repair before proceeding. Wall materials may contain asbestos and painted surfaces may contain lead, both requiring special handling and disposal in accordance with Section C20, Environmental and Emergency Support Services. All paint and adhesives shall meet the requirements of the Bay Area Air Quality Management District (BAAQMD) Regulation 8, Organic Compounds.
- C13.8.A.2.a Drywall Maintenance. Cracks, small dents, and holes shall be repaired with spackle over a backing plate when necessary. Spackle shall be feathered on the adjacent surfaces. Patches shall consist of at least three (3) coats with each completely dry before applying subsequent coatings. The final coat shall be lightly sanded and wiped with a damp cloth or sponge to remove all dust and cement deposits from surrounding surfaces. Loose nails or screws shall be pulled and replaced with a new nail or screw approximately one (1) inch away from the existing hole and driven in to form a slight dimple in the surface. The dimple and the existing nail or screw hole shall be filled and finished with spackle. Repair holes and other defects in wallboard between two (2) studs or beams by removing a rectangle of gypsum board to the center of the adjoining studs or beams and two (2) parallel lines across the board. Cuts shall be neat and shall not tear the paper covering. Edges of abutting sheets shall be sanded to allow for cement build-up in the joint. Replacement of gypsum board shall be of the same thickness and texture as the adjacent sheets and shall be nailed or screwed into place onto the exposed studs or beams. Joints shall be taped and

spackled using the procedure outlined above; reinforcing tape shall be embedded, wrinkle-free, and the first layer centered over each joint.

- C13.8.A.2.b Vinyl Wall Covering. Wall covering that has been ripped, scarred, stained, or otherwise damaged shall be repaired or replaced as necessary. Wall covering shall be repaired if the damaged area can be patched and not be noticeable. The patch shall overlay the damaged area 1/2-inch on all sides and be continuous with the pattern of the wall covering. The patch shall be glued in place with an adhesive conforming to the wall covering manufacturer's recommendations. Wall covering which is extensively damaged or for which a matching wall covering is not available shall be repaired by replacing the wall covering on the entire wall. If matching wall covering is not available, the Contractor shall find a comparable substitute. The COTR shall approve all replacement wall coverings that do not match the existing wall coverings. Replacement wall covering shall be hung according to the manufacturer's recommendations.
- C13.8.A.2.c Ceramic Tile. Ceramic tile walls, window stools, and marble saddles that are broken, missing, cracked, or discolored shall be replaced as required, to match existing. Tiles shall be re-grouted to provide a waterproof seal. In those cases where replacement tiles of an exact match cannot be found, the Contractor shall remove and replace non-defective tiles to create a pattern and minimize the visual effect of the mismatch.
- C13.8.A.2.d Hardboard Siding. Damaged hardboard siding shall be removed without damaging adjacent siding or underlayment. All replacement siding joints shall be located on studs and nailed at each stud. Replacement siding shall match the existing siding in color, texture, and material. Siding face and edges shall be factory primed. Nails shall be of the type and size specified by the manufacturer and shall be driven flush. A 1/16-inch space shall be left between the siding and wood or metal trim. All joints shall be caulked.
- C13.8.A.2.e Wood Trim. Wood trim items shall be prime painted on all sides and edges prior to installation. Surfaces to receive trim shall be thoroughly cleaned of sealant and paint build-up prior to installation of trim. Damaged or deteriorated insulation board or underlayment shall be replaced with material of the same type, thickness, and quality.
- C13.8.A.2.f Suspended Ceilings. Broken and stained ceiling tiles shall be replaced with tiles of the same material, style, size, and color. Damaged and broken suspended grid system shall be repaired and/or replaced as necessary to provide a suspended ceiling system as designed.
- C13.8.A.3 General Exterior Work.
- C13.8.A.3.a Exterior Walls. Damaged or deteriorated wall areas shall be restored to a serviceable, structurally sound, watertight, and weather-tight condition. This includes, but is not limited to, replacing damaged masonry units, tuck-pointing loose or eroded mortar joints, sealing penetrations in wall openings or air/water intrusion locations, replacing damaged or deteriorated siding and exterior trim, replacing miscellaneous hardware items, and removal of vegetation, discoloration, graffiti, or other defects which would render an unsightly appearance to exterior walls.
- C13.8.A.3.b Seams. Seams between window or doorframes, exterior walls, and expansion joints shall be caulked. Old joints shall be scraped and cleaned with a solvent

recommended by the caulking manufacturer. Caulking shall be applied according to the manufacturer's directions.

- C13.8.A.3.c Exterior Trim. Exterior trim, including all exterior moldings, millwork, shutters, and cornices shall be repaired or replaced as required. Surfaces to receive trim shall be thoroughly cleaned of sealant and paint build-up prior to installation of trim. Damaged or deteriorated insulation board underlayment shall be replaced with new material of the same type, thickness, and quality. Bird screens and soffit vents shall be intact and free of corrosion and missing pieces. All wood trim items shall be primed prior to installation and painted to match surrounding surfaces. All paint and adhesives shall meet the requirements of the BAAQMD Regulation 8, Organic Compounds.
- C13.8.A.4 Doors, Windows, and Screens. Doors (including storm doors), windows (including storm windows), and screens shall operate smoothly without binding or sticking in accordance with the manufacturer's design. Damaged, deteriorated, or missing doors, windows, screens, and associated components shall be repaired or replaced as required. Caulking, glazing, and weather stripping shall be fully intact to maintain a fully weather-tight seal.
- C13.8.A.4.a Wood Doors. All exterior wood doors shall have solid cores. Wood exterior doors shall be water-repellent treated and possess a minimum of one (1) hour fire rating. Interior wood doors shall be of the same species and have the same finish and fire rating as the original door. Replacement exterior doors shall be installed during the same workday as removal of original door. Scarred areas of door shall be sanded, wiped clean with a low toxicity solvent, sealed, and finished to match surrounding door surface. All replacement doors shall be installed with the hardware from the damaged door unless the hardware cannot be repaired. Small holes in door faces shall be filled and finished to match surrounding door surface. Doors shall be planed (to include appropriate bevel) to provide a minimum 1/16-inch clearance after painting between door and adjoining head and jambs. The bottom of the door shall be trimmed to provide adequate clearance above the floor.
- C13.8.A.4.b Screens and Screen Doors. Oxidation deposits shall be removed from metal parts. The affected area shall be cleaned with an approved cleaner and protective coating of paste wax shall be applied. Replacement screening shall be of the same material as existing screening. Exposed screening ends shall be cemented with colorless plastic cement. No exposed screening ends shall protrude from the screen. Warped screen doors and frames shall be straightened if possible to fit squarely in opening. If beyond repair, warped items shall be replaced.
- C13.8.A.4.c Windows. Damaged, deteriorated, missing, or inoperative window components shall be repaired or replaced to provide a sound, serviceable, weather-tight installation.
- C13.8.A.4.d Weather Stripping. Damaged or deteriorated weather stripping shall be replaced according to manufacturer's recommendations. Flattened spring type weather stripping shall be lifted or replaced to provide a better seal.
- C13.8.A.4.e Glass. The Contractor shall replace cracked or broken glass in doors or windows. Replacement glass shall be of the same size, type, and quality as the existing glass.
- C13.8.A.4.f Door Accessories. The Contractor shall install, maintain, repair, and adjust locks, latches, panic devices, and strikes of different makes, sizes, and shapes installed

in buildings and building components. The Contractor shall also install, repair, clean, repack, and adjust all makes and types of door closures.

- C13.8.A.4.g Hardware. Damaged, inoperable, or missing hardware such as hinges, locks, striker plates, latches, keepers, window-operating mechanisms, door closers, springs, etc. shall be adjusted, repaired, or replaced as required. Replacement hardware shall match existing hardware in type, size, quality, finish, and meet the BHMA Product Standards. Hardware shall be installed in accordance with the manufacturer's recommendations.
- C13.8.A.5 Countertops. Countertops with loose protective covering shall be repaired in place. Loose joints shall be secured and filled. Countertops and backsplash shall be the fully formed type comprised of a single unit with the shaped edges using wood nose molding at counter edge and covered wood molding or shaped wood block at juncture of the countertop and backsplash. Size and shape of countertop shall be indicated; backsplash shall not be less than 3-1/2 inches high.
- C13.8.A.5.a Plywood Countertop Material. Plywood core material shall be Grade B-C, softwood plywood, 5-ply, 3/4-inch minimum. Particleboard core material shall conform to ANSI A208.1, and shall have a fully waterproofed binder with a minimum thickness of 3/4-inch. Backsplash shall be of similar construction.
- C13.8.A.5.b Countertop Adhesive. The adhesive for bonding plastic laminates, edging, and trim to the core material shall be rubber-based contact cement. All adhesives shall meet the requirements of the BAAQMD Regulation 8, Organic Compounds.
- C13.8.A.5.c Countertop Laminates. Laminates of the same kind shall be applied in the longest length practicable. Joints in surface sheeting shall be tight and flush and kept to a practicable minimum. Design, color, and finish shall be of the same kind or selected per the CTO.
- C13.8.A.5.d Metal Trim. Damaged metal trim shall be removed and replaced with trim of the same configuration and finish. Joints shall be mitered and smooth. All such trim shall match for an acceptable appearance.
- C13.8.A.5.e Sink Rims. Sink rims shall be of the clamping type and a standard product of a manufacturer regularly producing this type of equipment, and shall be fabricated from corrosion-resistant steel of the size necessary to receive a sink.
- C13.8.A.5.f Cabinet Bases. Wood or plastic laminate cabinets that are damaged shall be repaired or replaced. All exposed items shall match for an acceptable visual appearance. Hardware items shall conform to the ANSI/BHMA A156 (BHMA 201) for institutional applications. Exposed hardware shall be corrosion resistant.
- C13.8.A.5.g Kitchen Cabinets. Replacement cabinets shall conform to the requirements of ANSI/KCMA A161.1 except as specified below. Cabinet design shall be flush overlay or reveal overlay, and the doors solid flush face. Wall and base cabinets shall be essentially of the same construction and outside appearance. The cabinets may be constructed with frame fronts and solid ends, or frame construction throughout. Frame members shall be 3/4 x 1-1/2 inch kiln dried hardwood, mortised and tenoned, dovetailed or doweled, and glued together. Top and bottom corners shall be braced with hardwood blocks that are affixed with water-resistant glue and nails. Base cabinets shall be provided with an integral toe space at least two (2) inches deep and three (3) inches high. Cabinets shall be installed level, plumb, and well secured to walls and floors.

- C13.8.A.6 Woodwork. Sections of woodwork containing rotted or badly deteriorated wood surface on which such trim was applied shall be cleaned of all dirt, oil, grease, mold, mildew, moisture, and debris. New woodwork matching the existing shall be installed. Woodwork shall be secured where loose. Protruding nails shall be set and filled. Rough woodwork shall be sanded to remove paint or varnish runs and abrasions. Paint may contain lead and will be tested by the Government prior to sanding. If the paint contains lead, then the Contractor shall perform the lead abatement in accordance with Section C20.7.B, Environmental and Emergency Support Services; Indefinite Delivery Indefinite Quantity Work; Lead Abatement. Holes shall be filled and lightly sanded to provide a smooth, uniform surface. Filled areas to be varnished shall be stained to match surrounding areas. Areas of chipped or peeling paint shall be lightly sanded and wiped clean to remove debris. All repaired and replaced woodwork shall be finished to match surrounding woodwork. Trim to be painted shall be sanded, cleaned, and sealed.
- C13.8.A.7 Stairs. The Contractor shall secure loose treads, risers, stringers, handrails, brackets, and other components. Badly damaged stair and handrail components shall be repaired or replaced and finished to match original components. Trim items susceptible to damage during the repair activity shall be removed and reinstalled upon completion of the repair activity.
- C13.8.A.8 Built-In Fixtures. The Contractor shall fabricate, install, repair or replace built-in fixtures, trim, doors, door and window hardware, windows, blinds, interior and exterior walls, wall surfaces, floors, ceilings, roofs, nameplates and holders, walls, mailboxes and mail slots, signs, and small structures.
- C13.8.A.9 Boxes, Crates, and Carts. The Contractor shall fabricate tailored boxes, crates, and carts made of wood and possibly insulation-type material for protection on an as-needed basis per user specific requirements. (This responsibility does not include crating of household goods and personal effects). The Contractor shall provide blocking and bracing to prevent movement of material or equipment during transport or storage.
- C13.8.A.10 Exterior Accessories and Storage Structures. Damaged, missing, defective, or badly deteriorated portions of exterior steps, landings, railings, and exterior storage facilities shall be replaced or repaired to a safe and usable condition. Loose items, such as railings, shall be secured. Damaged or deteriorated exterior floors and walls shall be repaired.
- C13.8.A.11 Traverse/Curtain Rods. Sagging and/or nonfunctioning rods shall be restored to an operating condition, if possible. If beyond repair, rods shall be replaced. Loose brackets shall be secured. Broken cords shall be replaced. Broken or missing drapery slides shall be replaced. Rods shall be level and parallel with the ceiling. Additional support brackets shall be installed to support sagging rods.
- C13.8.A.12 Window Coverings. Window blinds and shades shall be restored to a smooth operating condition. Cracked or damaged slats shall be replaced. Broken or worn cords shall be replaced. Soiled or worn tapes shall be replaced. Loose or missing brackets and supports shall be secured or replaced. Damaged or deteriorated hardware shall be replaced or reworked to an operating condition. Damaged rails and torn fabric shall be repaired. If beyond repair, blinds and shades shall be replaced.
- C13.8.A.13 Bathroom Accessories. Damaged, deteriorated, or missing accessories shall be repaired, or replaced if beyond repair. Items shall include, but not be limited to, mirrors, soap trays, towel bars, toilet paper rollers, hardware components, and shower curtain rods. Standard liquid soap, paper towel, and toilet paper dispensers will be provided when replacement is required.

- C13.8.A.14 Caulking. Damaged caulking around sinks, shower stalls, tiles, and accessories shall be chiseled out and replaced with a mildew resistant, silicone-based sealant. The sealant shall be applied according to manufacturer's recommendations.
- C13.8.A.15 Temporary Structures. The Contractor shall anchor and level temporary structures, primarily modular buildings or trailers. Earthquake bracing shall be installed per local codes and regulations.
- C13.8.A.16 Metal Door Frames and Windows. Remove and install metal doorframes and windows in concrete masonry units and concrete walls.
- C13.8.A.17 Nameplate Holders. Missing or damaged nameplate holders shall be replaced with holders of the same type and quality as the existing ones. Loose screws shall be tightened and resealed as necessary.
- C13.8.A.18 Masonry Units. Damaged masonry units (brick or concrete blocks) shall be replaced with a unit of the same size, color, and texture. The mortar shall be completely removed and the cavity cleaned and all debris removed. The masonry unit shall then be resealed in mortar and the remaining cavity packed with mortar. The Contractor shall mix mortar, determine correct type of material and mixture; run lines and levels as required; and cut, shape and lay bricks, stone, and block. The masonry unit shall be painted to match existing units. Paint shall meet the requirements of the BAAQMD Regulation 8, Organic Compounds.
- C13.8.A.19 Foundations and Walls. The Contractor shall construct, maintain, and repair masonry and wood foundations and walls.
- C13.8.A.20 Mortar Joints. Damaged mortar joints shall be chipped out, cleaned, and dampened before being re-pointed. Re-pointed joints shall match existing undamaged joints.
- C13.8.A.21 Interior Concrete. Cracked, broken, or spalled areas shall be patched with a non-shrinking cement mortar. Areas shall be cleaned and all loose concrete removed. Underlying surfaces shall be chipped to ensure bond with the patch. Shallow spalled areas shall be chipped to provide space for an adequate patch thickness. The patch shall be finished even with the adjacent surfaces and finished to match existing texture.
- C13.8.A.22 Pouring Concrete. The Contractor shall mix, pour, and finish concrete, including placing reinforcements and other embedded items such as markers, posts, etc. Additionally, the Contractor shall re-paint any previously marked curbs and zones and replace any previously existing markers.
- C13.8.B Metalworking. The Contractor shall maintain, repair, and replace metal components of buildings and structures; install building equipment, such as exhaust fans; and shall construct and install metal components in support of other repair activities. Metalworking shall include heating and bending to form metal shapes, drilling, torch cutting, grinding, sawing, and fitting of metal parts. Metalworking responsibilities shall also include the full range of metalworking and sheet metal activities that include, but are not limited to:
- C13.8.B.1 Welding. Welding provides the necessary support to the other trades in accomplishment of their work and shall include, but not be limited to, pipes, pressure vessels, structural forms, plates, railings, sheet metal, bar stock, and machinery in the maintenance of building structures, public utilities, transportation, and construction equipment. The Contractor shall build up metal surfaces of equipment for machining, braze and silver solder various metals, pre-heat items to be welded by torch, stress relieve, and anneal. Use various electric arc or gas welding methods. The following safety precautions are to be followed for all welding work accomplished by the Contractor.

- C13.8.B.1.a Fire Watch. Welding, burning, and open flame work will be permitted, but only subject to the following conditions:
- C13.8.B.1.a(1) The Contractor shall inform the COTR when the process shall be performed.
- C13.8.B.1.a(2) The Contractor shall provide an adequate fire watch and the required fire extinguishing equipment. The fire alarm system shall be deactivated or re-routed during welding, and immediately restored thereafter.
- C13.8.B.1.a(3) The Contractor shall obtain the proper permits required.
- C13.8.B.2 General Sheet Metal. The Contractor shall interpret blueprints, drawings, sketches, and work orders; use templates or patterns as guides in laying out and cutting materials from a variety of sheet metal stocks including aluminum, copper, galvanized and stainless steel; form single-hem and double-hem edges, seams, and flanges; lay out and cut materials for any combination of shapes, allowing for seams, joints, laps, and shrinkage; shear, bend, and form metal parts into desired shapes with hand and power tools and equipment; determine dimensions by application of basic shop mathematics and use of scribing tools, dividers, rules, and other measuring devices; use such equipment as shears, brakes, bending machines, and associated hand tools; repair, position, and clamp work; preheat metal and maintain heat to prevent distortion; use templates, jigs, blueprints, and other guides to repair, modify, or fabricate metal items for all types of equipment. Join parts by riveting, soldering, and spot welding. Semi-concealed hinges shall be of Type I through V materials, per BHMA Standards. Fasteners for hardware or particleboard core elements shall be of the through-bolt type.
- C13.8.C Pipefitting. The Contractor shall lay out, cut, bend, assemble, and install pipe, fittings, and fixtures to construct or maintain piping systems such as steam heating, hot water heating, hydraulic, high pressure air, chilled water systems, oil line systems, domestic water, de-ionized water, fire water, natural gas, storm drains, and sanitary sewer systems at Moffett Field. Lay out piping systems or sections from blueprints, work orders, sketches, or drawings and plan assembly in relation to walls, passageways, obstructions, existing underground utilities, underground trenches, location of machinery, and determine appropriate places for holes, clamps, struts, hangers, and similar considerations. Cut, bend, thread, weld, solder, and assemble pipefittings, using various types of shop machinery and equipment. Pack pipe as necessary to avoid flattening during bending operations. Make up various kinds of pressure tight joints, such as threaded, flange-bolted, flange-welded, soldered, silver soldered, caulked lead, and cemented. Bore holes in partitions, walls, floors, ceilings, and other obstructions to permit passage of pipe, exercising care to avoid impairing structures to be passed through. Install piping and any necessary hangers, brackets, and other supporting fixtures, position and align pieces for welding where required. Position, secure, and connect to piping systems various fixtures such as radiators, toilets, urinals, sinks, laundry equipment, food preparation equipment, pumps, and tanks. Install various types of hand controlled and automatic valves, traps, thermostats, and similar devices. Pack, adjust, and repair valves of various types. Repair leaks, clear obstructions in piping, and make changes and adjustments to obtain proper circulation and flow.
- C13.8.C.1 Disinfecting Water Pipes. All work on pipe sections in retrofit work when the existing water pipe has to be maintained in operation during the disinfection shall adhere to AWWA/ANSI C651-99, Standard for Disinfecting Water Pipes.
- C13.8.D Painting. The Contractor shall perform all painting related to this contract. The Contractor shall prepare surfaces, mix paints, and apply prime, intermediate, and finish coats. Paint includes all enamels, paints, varnishes, stains, and other coatings whether primer, intermediate, or finish coat. Paint used in touch-up painting shall blend with the color and texture of surrounding areas or match piping color code requirements. Touch-up painting shall be accomplished as a related item to a maintenance activity. Other painting that

exceeds the TC limit will be subject to Davis-Bacon Act (DBA) wage requirements per Section C7.3.C.1, Indefinite Delivery Indefinite Quantity Work; CHUP Work; Detailed Cost Estimate Preparation; Total Labor Cost Estimate.

- C13.8.D.1 Painting Responsibilities. Painting responsibilities shall include, but are not limited to: Determining type of paint best suited for the job, mixing colors for consistency needed to accomplish the work, performing stenciling of signs, preparing and working on a variety of surfaces such as metals, wood, and masonite; repainting and touching up building numbers and signs in place on buildings, structures, and appurtenances, painting all repairs (paint used for areas); moving, resetting, and protecting furniture, equipment, and all Government-owned property during the work performance period. The Contractor shall comply with the BAAQMD Regulation 8, Organic Compounds, Santa Clara County Hazardous Materials Storage Ordinance, and all other environmental directives, instructions, policies, and regulations as listed in Attachment 2.06.01, Section J.
- C13.8.D.2 Material. Paints shall be in sealed containers that plainly show the designated name, formula, or specification number, batch number, color date of manufacturer's directions, and name of manufacturer, all of which shall be plainly legible at the time of use. Pigmented paints shall be furnished in containers not larger than five (5) gallons. The use of paint containing lead is strictly prohibited for painting any surface. The use of recycled paints is acceptable, if available. Upon request from the COTR, the Contractor shall furnish a supplier's record of batch production data and test results for each batch, except that batch production data may be limited to weight per gallon, viscosity, fineness of grind, drying time, color, and gloss. When the required quantity of material of a particular color is five (5) gallons or less, a proprietary brand of material similar to that specified above may be used.
- C13.8.D.3 Plaster or Wallboard Surfaces. Damaged surfaces shall be repaired. Surfaces that chalk severely shall be prepared with conditioner.
- C13.8.D.4 Wood Surfaces. Woodwork, including cabinets and doors, shall be repaired. Surfaces painted with a gloss or semi-gloss paint must be dulled with a surface conditioner prior to final application. Knots and resinous wood should be treated with a knot sealer.
- C13.8.D.5 Wood Windows and Doors. Window screens and door screens shall be removed before painting. All screen frames shall be painted on faces and edges and allowed to dry; then replaced and fitted. Window runners shall not be painted, but cleaned and coated with boiled linseed oil or similar product(s).
- C13.8.D.6 Ferrous Metal Surfaces. All ferrous metal surfaces shall be spot primed. These surfaces shall be scraped, wire brushed, and washed clean before painting. Exposed nails and other ferrous metal on or in contact with surfaces to be painted with water-thinned paint shall be spot-primed first.
- C13.8.D.7 Galvanized and Zinc Copper Alloy Surfaces. All galvanized surfaces shall be cleaned with a phosphoric acid wash and spot primed with galvanized surface primer.
- C13.8.D.8 Masonry and Concrete Surfaces. All masonry and concrete surfaces shall be roughened where necessary to provide adhesion for application of paint. Previously painted areas shall be dulled with a surface conditioner. Surfaces that chalk severely shall be prepared with a Government approved conditioner. Surfaces that experience water leakage shall be coated with epoxy paint. Paint shall meet the requirements of the BAAQMD Regulation 8, Organic Compounds.
- C13.8.D.9 Pipe Coverings. Pipe coverings shall be brushed with a stiff fiber brush and size applied to bare surfaces of covering for adhesion.

- C13.8.D.10 Electrical Fixtures. Electrical outlet covers, switch covers, and fixtures shall be masked or removed before painting and uncovered or reinstalled prior to work completion.
- C13.8.D.11 Application of Paint. Application of paint shall be by brush, roller, or spray. Interior paint shall be applied in dust free conditions in accordance with the manufacturer's recommendations. Exterior paint shall not be applied on rainy, foggy, or windy days. The outdoor or indoor temperature shall be within the manufacturer's recommendations before the next coat is applied. Each coat shall be prepared in accordance with the paint manufacturer's recommendations. Each coat of paint shall be of sufficient thickness to completely cover the previous coat or surface. Each coat shall be sanded and dusted as prescribed by the paint manufacturer to produce a finish smooth and free from runs, sags, or other surface preparation defects. Paint surfaces adjoining other materials or colors shall be sharp and clean without overlapping. Stuck windows shall be freed to assure ease of operation within five (5) days following completion of work.
- C13.8.E Plumbing. The Contractor shall repair or replace water lines, drain lines, and fixtures. Pipes containing lead shall not be used. Additional work includes, but is not limited to: cleaning out sluggish sinks and sink traps; replacing parts such as valves and traps; re-caulking various plumbing fixtures; resetting toilets, urinals, sinks, fixture stops, supply lines; repairing or replacing flush valve assemblies, continuous waste arm assemblies, auxiliary valves, escutcheons, pistons, diaphragms, and handles to flush valves; replacing spuds and spud washers, vacuum breakers, tail pipes, and flush valves; replacing shower heads and necks; replacing plumbing brass, gas connections, stops, toilet seats, and water tank covers; taking general visual inspection of all plumbing fixtures and pipes; readjusting sensors; making minor repairs, including tightening bolts, nuts, and pipe connections; repairing drinking fountains; and repairing or replacing hot water heaters.
- C13.8.E.1 Clogged Toilet, Urinal, or Sink Drains. Work may include disassembly of fixture, exterior or interior piping and traps, and cleaning out pipes. Removal of any fixture requires the replacement of all bolts, nuts, washers, wax seals, and caulking. All slip joint washers are to be replaced with new after each removal.
- C13.8.E.2 Loss of Water Pressure. If loss of water pressure occurs within the piping, the Contractor shall determine the source of the problem and repair it as quickly as possible. Work may include disassembly and removal of interior piping, cleaning out of piping, or replacing of existing piping with new piping of like materials.
- C13.8.E.3 Overflowing Plumbing Fixtures. The water supply shall be turned off in the event of an overflowing plumbing fixture. Faulty valves/faucets and blockages shall be repaired and the service restored within 48 hours. The Contractor shall remove water from floors and repair any damage.
- C13.8.E.4 Back Flowing Floor Drains and Disposal Units. Back flowing floor drains and disposal units shall be treated as clogged drains as discussed above.
- C13.8.E.5 Loss of Hot Water. The water supply shall be turned off in the event of leaking hot water pipes or water heaters. Leaking pipes or water heaters shall be repaired or replaced and service restored as quickly as possible. While performing the needed repair or replacement, the Contractor shall also repair any damage caused by the defective item to restore the building or facility to its original condition. For example, replacement of a leaky pipe would also include repair of water damage to the surrounding walls, floor, and/or ceiling.
- C13.8.E.6 Sump and Ejector Pumps. If the pumps are not operational, the systems involved are to be shut down and affected restrooms tagged "out of order". The Contractor shall determine the source of the problem and make repairs. System is to be restored to normal operations within one (1) working day. If pump failure requires lead-time for

delivery of parts or components, a temporary pump of adequate size shall be installed in its place until the proper components become available.

- C13.8.F Locksmith. The Contractor shall work closely with NASA's Protective Services Office for maintenance work involving all Government cores. Planning, establishing, and maintaining a master key system with records will be provided by the Government under the NASA Locksmith Office.
- C13.8.G Electrical. The Contractor shall be responsible for electrical work which includes but is not limited to: installation, maintenance, repair or removal of low voltage electrical circuits, panel boards, motor control centers, building load centers, power distribution systems, intercom systems, tele-metering systems, and equipment. Electrical work shall be limited to interior and exterior distribution systems up to 600 volts. This includes appliance equipment, power tools, and industrial and office building distribution needs. The Contractor shall provide inspection services on all portable electrical equipment in accordance with the NASA Facilities Maintenance and Operations Management, NPR 8831.2E.
- C13.8.G.1 Re-lamping. The Contractor shall remove and replace all interior incandescent light bulbs and fluorescent tubes that have burnt out or been broken, and other defective parts such as, but not limited to, ballasts, starters, etc. Leaking or smoking ballasts may contain PCBs and shall be managed in accordance with Section C20, Environmental and Emergency Support Services. Burnt out bulbs, lamps, and troubling bulbs or lamps reported by customers will be considered a TC and shall include cleaning of lenses, reflectors, and luminaries, to obtain maximum lighting output. Energy saving lamps shall be used for re-lamping when applicable per Section C8.8, Energy and Water Management; Detailed Specifications. The Government will provide disposal containers for fluorescent light bulbs.
- C13.8.G.2 Emergency Lights. The Contractor shall remove and replace emergency lights that are defective or unable to light up per the lighting standards and duration as specified in NFPA 101 and any new lighting units must be capable of meeting these code requirements. Emergency lighting problems will be considered a TC unless the cost exceeds the TC limit as specified under Section C5.2, Trouble Calls.
- C13.8.H Roofing. The Contractor shall repair or replace damaged, deteriorated, or missing roofing, sheathing, flashing, gravel stops, miscellaneous roof structures and components, and structural supports as required to provide a watertight seal and to retain the original condition of the roof system. The Contractor shall accomplish temporary repairs under wet conditions to protect Government property and personnel. Durable permanent repairs shall be completed as soon as conditions allow. All roofing work shall be in accordance with the National Roofing Contractors Association (NRCA) and the Roofing Industry Educational Institute (RIEI). All roofing materials applied shall be per the manufacturer's recommendations. Some existing roofing may contain asbestos that will require special handling and disposal by the Contractor in accordance with Section C20, Environmental and Emergency Support Services.
- C13.8.H.1 Re-roofing. The Contractor shall remove existing roofing system and insulation and make any necessary deck repairs prior to the installation of the new roofing system. The Contractor shall install the new roofing system, insulation (if insulation is required), and rooftop equipment in accordance with the material manufacturer's specifications and the NRCA standards. The Contractor shall modify all plumbing, ducting, and electrical connections to conform to the new roofing and equipment heights. All re-roofing work shall be ordered under the IDIQ section of this contract.

END OF SECTION C13

SECTION C14**MECHANICAL SYSTEMS MAINTENANCE AND REPAIR****C14.1 GENERAL REQUIREMENTS**

General Intention. The Contractor shall provide all labor, supervision, materials, lubricants, oils, tools, equipment, transportation, and management necessary to accomplish the operation, predictive maintenance, preventive maintenance (PM), trouble calls (TC), and repair of mechanical equipment and systems that includes, but are not limited to: air compressors, tanks, and filters, vacuum pumps, air dryers, oily water separators, sliding and roll doors, exterior and emergency doors, elevators, electric sliding gates, pedestrian turnstiles, and associated equipment identified in Attachments 2.14.01 through 2.14.09, Section J.

C14.2 DEFINITIONS

Associated Fittings. Those fittings (mechanical, soldered, or welded) that exist or require new, on both or either end of a run of piping, to allow for the removal and/or reinstallation of said piping for repair or replacement.

Clean. The term “clean” as referred to in this section means: free of all dust, dirt, rust, corrosion, grease, oil, grime, and foreign matter to a bare surface leaving no injurious effects.

Critical Equipment. Those systems or pieces of equipment and their associated components, if damaged, would cause death or injury to personnel or severe loss of value, or compromise NASA mission research. NASA shall designate all critical pieces of equipment and their associated components and systems.

Interferences. An interference is any part of a piece of equipment, obstruction or blockage, whether installed or portable, that must be moved, removed, or disturbed in the accomplishment of work specified in this work section.

Material Condition. The overall existing physical state of existence of a piece of equipment and its associated components with regards to age, appearance, assembly, assessment, evaluation, and appraisal.

Proper Operation. A piece of equipment or system that is operated in accordance with the manufacturer's specifications and its design parameters.

C14.3 GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES

Refer to Section C3.

The Government will furnish the disposal of all oils and lubricants generated on site in accordance with Section C20, Environmental and Emergency Support Services.

APR 1700.1, Chapter 10, Pressure Systems Safety.

C14.4 CONTRACTOR FURNISHED ITEMS

Refer to Section C4.

C14.5 FIXED PRICE WORK

The following contract requirements shall be performed per the Performance Requirements Summary (PRS), Attachment 3, Section J, at the frequencies or performance criteria specified within the contract requirement:

C14.5.A Trouble Calls (TC). The Contractor shall respond to all TC related to this section and accomplish any necessary repairs per Section C5.2, Firm Fixed Price Work, Trouble Calls.

C14.5.B Contract Requirement No. C14-501, Air Compressors and Vacuum Pumps.

Code Compliance Standard(s) – CFR Title 24; RS Means; Manufacturer's Data

Attachment(s) – 2.14.01, Section J, Air Compressors Inventory; 2.14.03, Section J, Vacuum Pumps Inventory

PM Checklists – C14-501A-D, Section J.

The Contractor shall perform PM on the air compressors and vacuum pumps listed in Attachments 2.14.01 and 2.14.03, Section J, and in accordance with Paragraph C14.8.G, Maintenance Requirements and Procedures. Pressure test tanks per Ames Health and Safety Manual APR 1700.1, Chapter 10.

C14.5.C Contract Requirement No. C14-502, Oily Water Separators.

Code Compliance Standard(s) – CFR Title 24; RS Means; Manufacturer's Data

Attachment(s) – 2.14.04, Section J, Oily Water Separators Inventory

PM Checklists – C14-502A, B, Section J.

The Contractor shall perform PM on the oily water separators associated with all air compressors, vacuum pumps, two (2) aircraft wash racks, and two (2) vehicle wash racks. PM shall include servicing the filtering media associated with the equipment. See Attachment 2.14.04, Section J, for a listing of separators and filters. PM shall be in accordance with Paragraph C14.8.G, Maintenance Requirements and Procedures.

C14.5.D Contract Requirement No. C14-503, Air Compressor Air Dryers.

Code Compliance Standard(s) – CFR Title 24; RS Means; Manufacturer's Data

Attachment(s) – 2.14.02, Section J, Air Compressor Air Dryers Inventory

PM Checklists – C14-503, Section J.

The Contractor shall perform PM on the air compressor air dryers listed in Attachment 2.14.02, Section J, and in accordance with Paragraph C14.8.G, Maintenance Requirements and Procedures.

C14.5.E Contract Requirement No. C14-504, Horizontal Sliding and Vertical Roll Doors.

Code Compliance Standard(s) – CFR Title 28 Part 4.13-14; RS Means; Manufacturer's Data

Attachment(s) – 2.14.05, Section J, Horizontal Sliding and Vertical Roll Doors Inventory

PM Checklists – C14-504, Section J.

The Contractor shall perform PM on the sliding and roll doors listed in Attachment 2.14.05, Section J, and in accordance with Paragraph C14.8.H, Horizontal Sliding and Vertical Roll Doors.

C14.5.F Contract Requirement No. C14-505, Exterior and Emergency Doors.

Code Compliance Standard(s) – CFR Title 28 Part 4.13-14; NFPA 101; RS Means; Manufacturer's Data

Attachment(s) – 2.14.06, Section J, Exterior and Emergency Doors Inventory

PM Checklists – C14-505, Section J.

The Contractor shall perform PM on all building exterior doors and emergency egress doors listed in Attachment 2.14.06, Section J.

C14.5.G Contract Requirement No. C14-506, Elevators.

Code Compliance Standard(s) – CFR Title 28, Part 4.10; ASME A17.1

Attachment(s) – 2.14.07, Section J, Elevators Inventory.

PM Checklists – C14-506, Section J.

The Contractor shall perform PM on elevators listed in Attachment 2.14.07, Section J, in accordance with ASME A17.1, Safety Code for Elevators and Escalators with applicable addenda, and Paragraph C14.8.G, Maintenance Requirements and Procedures. All operable elevators shall have a current elevator certification sheet clearly visible inside the cab at all times and duplicated on file.

C14.5.H Contract Requirement No. C14-507, Automatic Sliding Gates.

Code Compliance Standard(s) – NFPA 1, 18.2.1, Uniform Fire Code

Attachment(s) – 2.14.08, Section J, Automatic Sliding Gates Inventory

PM Checklists – C14-507, Section J.

The Contractor shall perform PM on automatic electric sliding gates listed in Attachment 2.14.08, Section J, in accordance with NFPA 1, 18.2.1.

C14.5.J Contract Requirement No. C14-508, Pedestrian Turnstiles.

Code Compliance Standard(s) – Manufacturer's Data

Attachment(s) – 2.14.09, Section J, Pedestrian Turnstile Inventory

PM Checklists – C14-508, Section J.

The Contractor shall perform PM on pedestrian turnstiles listed in Attachment 2.14.09, Section J, in accordance with manufacturer's data.

C14.6 DOCUMENTATION AND REPORTING REQUIREMENTS

C14.6.A Contract Requirement No. C14-601, Equipment Certifications. The Contractor shall submit one (1) electronic copy and two (2) hardcopies annually of all required equipment certifications on elevators and air compressor tanks to the COTR no later than 30 calendar days after certifications are accomplished, or 30 calendar days after re-certification is due.

C14.6.B Contract Requirement No. C14-602, Oily Water Separators Report. The Contractor shall provide annually an oily water separators report to the COTR. Report shall state location, ID Number, date PM performed, description of service performed including filter changes and/or pumping volume action, and any noted discrepancies.

C14.7 INDEFINITE DELIVERY INDEFINITE QUANTITY WORK

Indefinite delivery indefinite quantity (IDIQ) work will be ordered in accordance with Section C7, Indefinite Delivery Indefinite Quantity Work, and may be ordered for any facility or area at ARC and MAC involving Mechanical Systems Maintenance and Repair. Maintenance, repair, or minor construction indefinite delivery indefinite quantity work shall be completed within the

number of days specified on the Contract Task Order (CTO). The Craft Hour Unit Price (CHUP) rates will apply to all IDIQ services in this section. Typical services ordered by the Government are shown below in this section.

- C14.7.A Repair Leaking Joints. The Contractor shall accomplish, but not be limited to, the repairs of leaking air piping joints, air filters, air regulating valves, air dryer piping joints, compressor gasket and piping joints, vacuum pump gasket and piping joints, and hydraulic piping, cylinders, electrical indicators, controls, and gasketed areas on man lifts per the CTO. Allowable Leakage: NONE.
- C14.7.B Gate Valve Replacement. The Contractor shall remove the existing valve(s) and install new gate valve(s) per the CTO.
- C14.7.C New Gate Valve Installation. The Contractor shall install new aboveground gate valves at specified locations per the CTO.
- C14.7.D Globe Valve Replacement. The Contractor shall remove the existing valve(s) and install new globe valve(s) per the CTO.
- C14.7.E New Globe Valve Installation. The Contractor shall install new aboveground globe valves at specified locations per the CTO.
- C14.7.F Copper Tubing. The Contractor shall remove the existing tubing and install new copper tubing and associated fittings per the CTO.
- C14.7.G Galvanized Steel Piping. The Contractor shall remove the existing piping and install new galvanized steel piping and associated fittings per the CTO.
- C14.7.H Air Pressure Gauges. The Contractor shall remove the existing gauge(s) and install new air pressure gauges per the CTO.
- C14.7.J Pressure Regulators. The Contractor shall remove the existing regulator(s) and install new pressure regulators per the CTO.
- C14.7.K Oil/Water Separator. The Contractor shall remove the existing separator(s) and install new oil/water separator per the CTO.
- C14.7.L Air Compressor. The Contractor shall remove the existing compressor(s) and install new air compressor(s) per the CTO.

C14.8 DETAILED SPECIFICATIONS

- C14.8.A Interferences. The Contractor shall remove and reinstall interferences necessary to accomplish PM and repair as required by this work section.
- C14.8.B Certifications. The Contractor shall accomplish all certifications and re-certifications on the equipment referred to in this section, required by all Federal, State, and local regulations. (Reference Contract Requirement No. C14-601, Equipment Certifications).
- C14.8.C Pressure Testing. The Contractor shall accomplish pressure testing for leaks when repairs or alterations are made involving the integrity of air, vacuum, lubricating, oil, and hydraulic systems while conducting maintenance or repair. Pressure levels, duration, and test setup shall be accomplished in accordance with the NASA ARC pressure vessel standard testing requirements. If the repair is made to a buried section of the system, the pressure test shall be accomplished prior to covering the repaired area.

- C14.8.D Forms. The Contractor shall obtain, fill-out and adhere to all NASA ARC required permit forms such as: burn permit; confined space entry permit; and all tag-out, lock-out procedures; in accordance with Section C20, Environmental and Emergency Support Services.
- C14.8.E Painting. The Contractor shall prepare, prime, and paint all new and disturbed surfaces to match the surrounding area as a result of the requirements of this contract section, in accordance with Section C13.8.D, Buildings and Structures Maintenance, Repairs and Alterations; Detailed Specifications; Painting; and Section C20, Environmental and Emergency Support Services.
- C14.8.F Environmental Safety and Health Services. The Contractor shall abide by all Federal, State, and local regulations with respect to personnel safety, and in accordance with Section C20, Environmental and Emergency Support Services. In addition, the Contractor shall handle all hazardous waste and environmental work associated with, or arising from this work section, in accordance with the requirements of Section C20, Environmental and Emergency Support Services.
- C14.8.G Maintenance Requirements and Procedures. The Contractor shall maintain all equipment in optimum operating condition and control. All mechanical systems under this section shall be operational, functional, and ready to respond to demand according to its designed purpose and intent. Any unscheduled or unplanned outage of these systems shall be down no greater than those occurrences and times specified in Attachment 2.16.03, Section J, herein referred to as the "outage limit", with the exception for scheduled or planned outages. For work that exceeds the TC limit, the time expended by the Contractor prior to the Contractor notifying the COTR of such condition shall be applied towards the outage limit. All other time will not be counted towards the outage limit for work exceeding the TC limit. Planned outages for maintenance and repair shall follow standard labor hours and practices per the R.S. Means® Facilities Maintenance and Repair Cost Data Handbook and the contract unit prices. Any time exceeding published labor hours may count towards the outage limit.

The Contractor shall prepare maintenance procedures per the following guidelines: (1) manufacturer's instructions; (2) industry standards and codes; (3) Federal, State, and local regulations; and (4) procedures outlined in NASA publications. As a minimum, the procedures shall include:

- C14.8.G.1 Equipment operating procedures including start-up, on-line or running parameters, shutdown, emergency, and lay-up procedures.
- C14.8.G.2 Plant system and equipment PM procedures and maintenance schedules.
- C14.8.G.3 Troubleshooting procedures for major equipment and systems.
- C14.8.G.4 Corrective maintenance and repair procedures.
- C14.8.G.5 Clearly defined duties, responsibilities, and qualifications for all maintenance personnel positions.

The Contractor shall keep all maintenance and repair records orderly, readily accessible, and simply referenced so they can be quickly accessed by all authorized Government authorities at any time.

- C14.8.H Horizontal Sliding and Vertical Roll Doors. Horizontal sliding and vertical roll doors shall operate smoothly without resistance. Railings shall be checked for alignments. Rusted or corroded areas shall be repaired or replaced. All bearings, rollers, gears, and pulleys shall be properly lubricated. All hangers, bolts, springs, and pins shall be free of rust, corrosion, and shall be tightly mounted and secured. Motors shall operate properly and be properly

lubricated. Cables and fusible links shall be properly installed and free from rust and corrosion. The Contractor shall perform PM per Contract Requirement No. C14-504, Horizontal Sliding and Vertical Roll Doors PM.

END OF SECTION C14

SECTION C15**STEAM DISTRIBUTION SYSTEM OPERATION, MAINTENANCE AND REPAIR****(MOFFETT BOILER PLANT)****C15.1 GENERAL REQUIREMENTS**

General Intention. The Contractor shall provide all labor, supervision, incidental engineering, materials, treatment chemicals, tools, equipment, transportation, and management necessary for the yearly operation, preventive maintenance (PM), predictive maintenance, trouble calls (TC), and repair of the Moffett Boiler Plant, Building 10; and associated steam distribution and condensate return systems, facilities, and equipment described in Attachments 2.15.01, 15.2, and 15.4, Section J. The work shall include, but is not limited to, operations work involving two gas-fired power boilers (750 HP and 250 HP); water sampling, testing, analysis, and treatment; boiler start-up and shut-down including daily (D7) site visits for inspections, checks, and adjustments; and maintaining records and preparing reports in order to provide high pressure steam 24 hours per day, seven (7) days a week throughout the term of the contract period, compliant with the directives, instructions, policies, and regulations listed in Attachment 2.06.01, Section J; TC and minor repair of the boilers, entire steam distribution system at Moffett Field, condensate return system, and associated facilities; PM work for annual boiler overhauls; annual boiler inspections, tuning, and certifications. PM work shall be accomplished per Section C5.3.A, Firm Fixed Price Work; Recurring Services; Preventive Maintenance.

C15.2 DEFINITIONS

Associated Fittings. Those fittings (mechanical, soldered, or welded) which are existing or required new, on both or either end of a run of piping, to allow for the removal and/or reinstallation of said piping for repair or replacement.

Clean. The term "clean" as referred to in this section means: free of all dust, dirt, rust, corrosion, grease, oil, soot, grime, mud, and foreign matter to a bare surface leaving no injurious effects.

Critical Equipment. Those systems or pieces of equipment and their associated components, if damaged, would cause death or injury to personnel or severe loss of value, or compromise NASA mission research. NASA shall designate all critical pieces of equipment and their associated components and systems.

Interferences. An interference is any part of a piece of equipment, obstruction or blockage, whether installed or portable, that must be moved, removed, or disturbed in the accomplishment of work specified in this section.

Material Condition. The overall physical state of existence of a piece of equipment and its associated components with regards to age, appearance, assembly, assessment, evaluation, and appraisal.

Power Boiler. A boiler operated at a pressure of more than 15 psig (but not more than 300 psig) for steam; or for hot water a pressure of more than 160 psig or a temperature of more than 250 degrees F.

Proper Operation. The operation of a piece of equipment or system in accordance with the manufacturer's specifications and design parameters, and specifications provided by the Government.

C15.3 GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES

Refer to Section C3.

The Government will furnish natural gas, electricity, and water for firing power boilers.

C15.4 CONTRACTOR FURNISHED ITEMS

Refer to Section C4.

C15.5 FIXED PRICE WORK

The following contract requirements shall be performed per the Performance Requirements Summary (PRS), Attachment 3, Section J, at the frequencies or parameters specified within the contract requirement:

C15.5.A Contract Requirement No. C15-501, Steam Generation Operations and Distribution.

Code Compliance Standard(s) – CFR Title 24, Part 4; BAAQMD; Manufacturer's Data

Attachment(s) – 2.15.01, Section J, Steam Distribution System Inventory; 2.15.02, Section J, Steam Distribution System Component Inventory; 2.15.04, Section J, Steam Trap Inventory

PM Checklists – C15-501, Section J.

The Contractor shall operate, maintain, and repair all Moffett Boiler Plant equipment and steam distribution and condensate return systems. Equipment shall be in operation continually, 24 hours per day, 365 days per year, at designated capacities and efficiencies, compliant with posted approved operating procedures, to meet year-round domestic hot water and seasonal domestic heating demand requirements and to ensure system reliability. Except during maintenance periods, the boilers shall operate and be fully functional 100 percent of the time at the efficiencies required in Paragraph C15.5.A.2, Boiler Combustion Limits. The Contractor shall restart failed systems within one (1) hour following verbal notification during regular working hours, and two (2) hours during other than regular working hours. Attendance visits at the boiler plant shall be of sufficient duration to complete a visual inspection and perform operator checks and necessary adjustments. Failure of the Government to supply water, fuel (natural gas), or electricity for plant operations will relieve the Contractor of responsibility for operations during the time period the Government is remiss in these supply functions. The Contractor shall return the boiler on-line within two (2) hours of delivery.

C15.5.A.1 Steam Pressure. The Contractor shall maintain the steam pressure at a minimum pressure of 80 psig and temperature of 310 to 320 degrees F exiting the boiler and the Moffett Boiler Plant (Building 10) for distribution. The steam distribution system shall maintain a minimum pressure of 80 psig at end points and minimize condensate losses due to leakage.

C15.5.A.2 Boiler Combustion Limits. The Contractor shall maintain combustion limits for both boilers in accordance with the most recent Bay Area Air Quality Management Districts (BAAQMD) Boiler, Steam Generator, and Process Heater Tuning Procedure and in accordance with operations that will maximize life and minimize costs.

C15.5.A.3 Operator Checks. The Contractor shall comply with the minimum attendance standards for safe and efficient boiler operation with central monitoring (FMCS). The Contractor shall record log entries on operator checks and adjustments daily, once per work shift, 365 days per year, at eight (8) hour intervals. The Contractor shall maintain a bound log book for both boilers in operation at the Moffett Boiler Plant identifying the operator's name, date, time, observations made, checks of flame failure and low water cut-off devices, meter readings, operational changes, all treatment chemicals used and of all laboratory analyses performed, and all other maintenance performed during each visit.

C15.5.A.4 On-Site Boiler Water Sampling and Testing. At least once every 24 hours, the Contractor shall collect feed water, boiler water, and condensate samples from the operating boiler for chemical residual testing. The Contractor shall take and record log entry results of daily on-site laboratory tests to determine or measure levels of hardness, causticity or alkalinity, phosphate, sulfite, total dissolved solids (TDS), and acidity (pH). Boiler water shall be maintained within the following chemical residual limits per the approved water treatment plan and in accordance with Paragraph C15.8.T, Maintenance Requirements and Procedures:

<u>Chemical</u>	<u>Residual</u>
P-Alkalinity (as CaCO ₃)	400 - 800 ppm
Phosphate	20 - 40 ppm
Sodium Sulfite	20 - 40 ppm
Total Dissolved Solids*	2000 - 4000 ppm
Proprietary Chemicals	As Approved by the COTR

* Varies depending on boiler parameters and steam use.

The Government reserves the right to change the water treatment plan parameters when new Federal, State, and local regulatory standards become available, or the Government decides that a modification is required in anticipation of regulatory changes.

C15.5.A.5 Sample Collection and Laboratory Analysis. The Contractor shall collect monthly samples of feed water, boiler water, and condensate (one (1) each, total of three (3)). Deliver samples to an outside independent laboratory for analysis and results.

C15.5.A.6 Steam Traps. The Contractor shall perform an annual PM on all steam traps located on the steam distribution system. See Attachment 2.15.04, Section J, for listing of steam traps and last temperature readings with comments. In addition to temperature measurements, collect ultrasonic data on all traps by storing the dB μ V reading when the trap purges and comparing with previous readings to make an assessment. Changes in ultrasonic wave emissions are indicative of changes in steam trap function.

C15.5.B Contract Requirement No. C15-502, Boiler Annual Repair and PM, Building 10.

Code Compliance Standard(s) – CFR Title 24, Part 4, Chapter 10, 1004; BAAQMD; RS Means; Manufacturer's Data

Attachment(s) – 2.16.04, Boilers Inventory (Building M010 only)

PM Checklists – C15-502, Section J.

The Contractor shall perform an annual PM and repair on both boilers and in accordance with Paragraph C15.8.T, Maintenance Requirements and Procedures.

C15.5.C Contract Requirement No. C15-503, Power Boiler Annual Certification Assistance.

Code Compliance Standard(s) – Cal- OSHA Title 8, Section 770, BAAQMD

Attachment(s) – 2.15.03, Section J, Boiler Permit (Sample)

PM Checklists – C15-503, Section J.

The Contractor shall perform a boiler certification in accordance with the Federal Division of the Occupational Safety and Health Administration inspection/certification requirements. The boiler certification process consists of up to four (4) phases: (1) External inspection, (2) internal inspection, (3) hydrostatic pressure testing, and (4) operational and safety testing. The Contractor shall schedule a hydrostatic pressure test and an operational test. The Government representative boiler inspector shall be present during testing. The Contractor shall perform preparation and reactivation procedures annually as specified in Attachment 2.15.03, Section J, and in accordance with Paragraph C15.8.T, Maintenance Requirements and Procedures.

C15.5.D Contract Requirement No. C15-504, Boiler Feed Water Pumps.

Code Compliance Standard(s) – CFR Title 24, Part 4, Chapter 10, 1004; RS Means; Manufacturer's Data

Attachment(s) – 2.16.05, Section J, Pumps Inventory (Building M010 only)

PM Checklists – C15-504, Section J.

The Contractor shall perform PM on feed water pumps listed in Attachment 2.16.05, Section J, and in accordance with Paragraph C15.8.T, Maintenance Requirements and Procedures.

C15.5.E Contract Requirement No. C15-505, Condensate Pumps.

Code Compliance Standard(s) – CFR Title 24, Part 4, Chapter 10, 1004; RS Means; Manufacturer's Data

Attachment(s) – 2.16.05, Section J, Pumps Inventory (Building M010 only)

PM Checklists – C15-505, Section J.

The Contractor shall perform PM on steam condensate return pumps as listed in Attachment 2.16.05, Section J, and in accordance with Paragraph C15.8.T, Maintenance Requirements and Procedures.

C15.5.F Trouble Calls (TC). The Contractor shall respond to all TC related to steam distribution and distribution per Section C5.2, Firm Fixed Price Work; Trouble Calls for all TC that fall outside the requirements set forth under Section C5.4.A, Firm Fixed Price Work; Operations; General.

C15.6 DOCUMENTATION AND REPORTING REQUIREMENTS

C15.6.A Contract Requirement No. C15-601, Bi-weekly Status Report. The Contractor shall provide an electronic copy of a status report bi-weekly to the COTR listing the results and status of work performed in accordance with Paragraph C15.5, Fixed Price Work.

C15.6.B Contract Requirement No. C15-602, Steam Trap Survey. The Contractor shall provide one (1) electronic copy and one (1) legible hard copy annually of the steam trap survey. Survey shall include ID number, location, size, temperature and ultrasonic readings of the traps, date trap was tested and replaced, and any analytical assessments or comments.

- C15.6.C Contract Requirement No. C15-603, Calibration Report. The Contractor shall provide one (1) monthly electronic copy to the COTR of all calibrated gauges and thermometers. Include date calibrated and next calibration date.
- C15.6.D Contract Requirement No. C15-604, Boiler Water Sampling Laboratory Results. The Contractor shall provide one (1) monthly electronic copy to the COTR of feed water, boiler water, and condensate water analysis and results from an outside independent laboratory. Results shall document chemical and residual parameters shown in Paragraph C15.5.A.4. Recommendations for improvement, if any, shall be annotated, and any deficiencies shall be corrected in a timely manner to achieve optimal corrosion and micro-biological growth control.
- C15.6.E Contract Requirement No. C15-605, Boiler Tuning Results and Certification Annual Report. The Contractor shall provide four (4) hard copies and one (1) electronic copy to the COTR of the boiler tuning results following the BAAQMD procedures and guidelines stated in Volume 1, Chapter 5 titled "Boiler, Steam Generator and Process Heater Tuning Procedure". To be submitted within ten (10) working days after completion of each boiler tuning. In addition, provide one copy of boiler permit to operate certification from the State of California.

C15.7 INDEFINITE DELIVERY INDEFINITE QUANTITY WORK

Indefinite delivery indefinite quantity (IDIQ) work will be ordered in accordance with Section C7, Indefinite Delivery Indefinite Quantity Work, and may be ordered for any facility or area at MAC involving Steam Distribution System Operation, Maintenance and Repair. Maintenance, repair, or minor construction IDIQ work shall be completed within the number of days specified on the Contract Task Order (CTO).

- C15.7.A Steel Piping. The Contractor shall remove the existing piping and install new Schedule 40 seamless steel pipe, associated fittings, fasteners, gaskets, and insulation per the CTO.
- C15.7.B Gate Valve(s). The Contractor shall remove the existing valve(s) and install new gate valve(s) per the CTO.
- C15.7.C Globe Valve(s). The Contractor shall remove the existing valve(s) and install new globe valve(s) per the CTO.
- C15.7.D Steam Trap(s). The Contractor shall remove the existing trap(s) and install new steam trap(s) per the CTO.
- C15.7.E Pipe Insulation. The Contractor shall remove the existing insulation and install new pipe insulation per the CTO.
- C15.7.F Relief Valve(s). The Contractor shall remove the existing valve(s) and install new relief valve(s) per the CTO.

C15.8 DETAILED SPECIFICATIONS

The Contractor shall accomplish the following detailed specifications and requirements in accomplishing work required by this work section:

- C15.8.A Obstructions. The Contractor shall remove and reinstall obstructions necessary to accomplish work required by this work section.

- C15.8.B Forms. The Contractor shall obtain, fill-out, and adhere to all NASA, Ames required permit forms such as: Burn permit, confined space entry permit, and all lock-out, tag-out procedures in accordance with Section C20, Environmental and Emergency Support Services.
- C15.8.C Operation of Certified Boilers. The Contractor shall not operate any power boiler that does not have a valid Annual State of California Inspection Certificate. The COTR shall be notified if unsafe conditions are found, following repair of a power boiler, or after any authorized modification to boilers, control equipment, or associated components. The affected equipment shall not be placed back in operation until written authorization is received from the Government.
- C15.8.D Environmental Health and Safety Services. The Contractor shall handle all hazardous waste and environmental work associated with, or arising from, this work section, in accordance with the requirements of Section C20, Environmental and Emergency Support Services.
- C15.8.E Replacement of Expansion Joints. Replacement of joints shall consist of removing insulation, fasteners, expansion joint and installing the new expansion joint, fasteners, and insulation. Apply anti-seize compound conforming to MIL-A-907 to all fasteners.
- C15.8.F Structural Support System. The Contractor shall repair or replace all deteriorated pipe hangers and supports, expansion loops, guy wires, anchor rods, screw anchors, turnbuckles, fasteners, and anchors.
- C15.8.G Valves. The Contractor shall repair or replace deteriorated, damaged, and leaky valves, stems, disks, seals, packing, and gaskets. If a valve requires disassembly for repair, the Contractor shall, while the valve is disassembled, clean the bonnet, lubricate the stem, and inspect the valve for signs of deteriorated or damaged packing and broken, bent, corroded, or missing parts. After the valve is restored, the Contractor shall apply system pressure to ensure all joints are sealed, and check for seat, body, and packing leaks, and check for proper operation, correcting any defects discovered. The Contractor shall apply anti-seize compound conforming to MIL-A-907 to gasket surfaces and moving parts. Valves under two (2) inches shall be replaced with new valves, if found defective.
- C15.8.H Traps and Y-Type Strainers. The Contractor shall repair or replace all defective parts of traps and Y-type strainers such as baskets, plugs, gaskets, bellows, floats, valves, valve seats, hooks, buckets, linkages, and strainer orifices. If repair requires disassembly, the Contractor shall clean, inspect, and test the trap or strainer in the same manner as valves. The Contractor shall test traps and strainers to determine correct operation, without breaking insulation. The Contractor shall apply anti-seize compound conforming to MIL-A-907 to gasket surfaces and moving parts.
- C15.8.J Gauge and Thermometer Calibration. The Contractor shall have all system gauges and thermometers professionally calibrated once a year to a transfer measurement standard to the manufacturers' requirements. Each gauge and thermometer shall be affixed with a calibration label denoting the name and location of the calibration facility, calibration date, and calibration due date.
- C15.8.K Fasteners. When required by deteriorated, missing, or damaged threads, the Contractor shall remove the existing fastener and install new fasteners that conform to MIL-S-1222, TYPE IV, GRADE B-7, alloy steel for threaded studs and bolts. New nuts shall conform to MIL-S-1222, TYPE I, GRADE 2-H, carbon steel. Apply high temperature anti-seize compound conforming to MIL-A-907 to all boiler and associated fasteners.
- C15.8.L Gaskets. When required, the Contractor shall install new gaskets conforming to the manufacturer's specifications and or the latest code and industry standards for boiler water sides and boiler fire sides. Apply high temperature anti-seize compound conforming to MIL-

A-907 to the gasket sealing surfaces. Removal of existing gaskets may require special requirements per Section C20, Environmental and Emergency Support Services.

C15.8.M Testing of Systems. When repairs and alterations are made involving the integrity of the steam distribution system, the Contractor shall, after all repairs are complete, pressurize the system and check for leaks in accordance with applicable safety standards. If the repair is made to an underground section of the system, the pressure test shall be accomplished prior to covering the repair area. Allowable leakage: NONE.

C15.8.N Insulation. The Contractor shall repair or replace damaged pipe insulation as part of PM or repair. If it becomes necessary to damage or destroy insulation to perform repairs to other components and provisions are not made in the CTO, the Contractor shall notify the COTR prior to damaging the insulation to request further approval since insulation may contain asbestos that requires additional procedures. When repairing or replacing insulation, the Contractor shall inform their personnel of the possible hazards of asbestos and shall comply with the requirements set forth in accordance with Section C20, Environmental and Emergency Support Services. In addition, the Contractor shall comply with the latest revisions of ASTM C552 for cellular glass insulation above ground or ASTM C547, ASTM C553, ASTM C592, and ASTM C612 for mineral fiber insulation. It is the responsibility of the Contractor to establish appropriate safety and health practices and determine applicability of regulatory limitations prior to use of a specific product. All replacement pipe insulation shall be calcium silicate with minimum thickness as follows:

<u>Pipe Size (In)</u>	<u>Insulation Thickness (In)</u>
2 and under	1.5
Over 2 through 5	2.0
Over 5 through 10	2.5

C15.8.P Conduit. The Contractor shall repair and replace damaged electrical conduits and tighten or repair defective or loose connections to all conduits.

C15.8.Q Valve Houses and Pits. The Contractor shall, while performing work in steam line valve houses and manhole pits, repair or replace defective covers, supports, guides, and ladders, and shall be alert to defects in other systems and the surrounding manhole and conduit.

C15.8.R Water Treatment. The Contractor shall provide chemical or mechanical water treatment to control corrosion to the steam boilers and the steam supply and return system. All water treatment shall conform to or exceed the requirements of the Cities of Sunnyvale and Palo Alto, CA for water discharge. See Attachments 2.20.05 and 2.20.06, Section J, for discharge permits and sewer use ordinances. The Contractor shall use a chemical system that incorporates the use of stationary, double contained chemical containers that are filled from a truck and hose fill system without removing the stationary containers and secondary containment from their parent locations.

C15.8.S Painting. The Contractor shall prepare, prime, and paint new and disturbed surfaces to match the surrounding surfaces, as a result of the requirements of this work section in accordance with Section C13.8.D, Buildings and Structures Maintenance, Repair and Alterations; Detailed Specifications; Painting, and Section C20, Environmental and Emergency Support Services.

C15.8.T Maintenance Requirements and Procedures. The Contractor shall maintain all equipment in optimum operating condition that will maximize life and minimize costs. All equipment shall be operational, functional, and ready to respond to demand according to its design purpose and intent except for scheduled or planned outages. For unscheduled and unplanned outages, the steam distribution system under this section shall be down no greater than those

occurrences and times specified in Attachment 2.16.03, Section J, herein referred to as the "outage limit". For work that exceeds the TC limit, the time expended by the Contractor, prior to the Contractor notifying the COTR of such condition(s), shall be applied towards the outage limit. All other time will not be counted towards the outage limit for work exceeding the TC limit. Planned outages for maintenance and repair shall follow standard labor hours and practices per the R.S. Means® Facilities Maintenance and Repair Cost Data Handbook. Any time exceeding published labor hours may count towards the outage limit.

The actual boiler firing efficiencies shall be in accordance with Contract Requirement No. C15-501, Steam Generation Operations & Distribution; Boiler Combustion Limits. The Contractor shall prepare maintenance procedures per the following guidelines: (1) Manufacturer's instructions; (2) industry standards and codes, (3) Federal, State, and local regulations; and (4) procedures outlined in NASA publications. As a minimum, the procedures shall include:

- C15.8.T.1 Equipment operating procedures including start-up, on-line or running parameters, shutdown, emergency and lay-up procedures.
- C15.8.T.2 Plant system equipment PM procedures and maintenance schedules.
- C15.8.T.3 Troubleshooting procedures for major equipment and systems.
- C15.8.T.4 Corrective maintenance and repair procedures.
- C15.8.T.5 Clearly defined qualifications, duties, and responsibilities, for all maintenance personnel positions and supervision.
- C15.8.U Operating Records and Logs. The Contractor shall maintain operating, laboratory, maintenance, personnel qualification, emergency condition, and operating cost records daily. The Contractor shall keep all operation, maintenance, and repair records orderly, readily accessible, and simply referenced so they can be quickly accessed by all authorized Government authorities at any time. The Contractor shall keep copies of all records at the Moffett Boiler Plant, Building 10.
- C15.8.U.1 The Contractor shall provide, maintain, and post current signs and instructions including, but not limited to, no smoking, electrical and chemical hazard warning signs, routine daily instructions, and routine laboratory analyses procedures required by the COTR and Federal, State, and local regulations.

END OF SECTION C15

SECTION C16**HEATING, VENTILATING, AIR CONDITIONING, AND REFRIGERATION (HVAC/R), AND BOILERS
MAINTENANCE AND REPAIR****C16.1 GENERAL REQUIREMENTS**

General Intention. The Contractor shall provide all labor, supervision, materials, oils, lubricants, tools, equipment, transportation, and management necessary for the operation, predictive maintenance, preventive maintenance (PM), corrective maintenance, trouble calls (TC) and repair of heating, ventilating, air conditioning, and refrigeration (HVAC/R) equipment, identified in Attachments 2.05.01, 2.05.02, and 2.16, Section J. The work shall include PM and repair of equipment and system components consisting of, but not limited to, gas, oil, solar, and electric heating boilers, centrifugal, reciprocating, and screw liquid and air-cooled air conditioning systems, ice storage systems, direct expansion package air conditioning units, self-contained computer cooling units, electric heat pumps, through-the-wall heating and air conditioning units, cooling towers, air handling units, unit heaters, refrigerant compressors, humidifiers, ventilation blowers/fans, service valves, dampers, condensers, coils, chillers, pumps, purge units, electrical and mechanical controls, duct work, piping, motors, evaporators, air filters and dryers, thermostats, humidifiers, fan coil units, water coolers, ice machines, refrigerators, reach-in freezers, and; performance of seasonal equipment start-ups and shut-downs; annual heating boiler overhaul, associated inspection and certification assistance; maintaining records and preparing reports to ensure safe and efficient equipment operation in compliance with the Bay Area Air Quality Management District (BAAQMD) rules and regulations, and to maximize the life of each piece of equipment for optimum operational efficiency. All additional costs associated with performance of refrigerant leak detection, reclamation, cleaning, reporting, and recycling shall be provided at no additional cost to the Government. PM and repair work shall be performed per Section C5, Firm Fixed Price Work, Section C7, Indefinite Delivery Indefinite Quantity Work, and comply with the applicable directives, instructions, policies, and regulations listed in Attachments 2.06.01, Section J.

C16.2 DEFINITIONS

A/C Plant. The A/C plant includes, but is not limited to, the chiller, evaporator, condenser, economizer unit, chiller controls and instrumentation, and other ancillary equipment required for operation of the air conditioning system. This does not include air handler and circulation systems.

Associated Fittings. Those fittings (mechanical, soldered, or welded) which are existing or required new, on both or either end of a run of piping, to allow for the removal and/or reinstallation of said piping for repair or replacement.

Clean. The term "clean" as referred to in this section means: free of all dust, dirt, rust, corrosion, grease, oil, soot, grime, slime, mud, growth, and foreign matter to a bare surface leaving no injurious effects.

Cooling Season. The cooling season is defined as the six (6) month period from 1 May through 31 October.

Critical Equipment. Those systems or pieces of equipment and their associated components, if damaged, would cause death or injury to personnel or severe loss of value, or compromise NASA mission research. NASA shall designate all critical pieces of equipment and their associated components and systems.

Heating Boiler, Low Pressure. A boiler operated at pressures not exceeding 15 psig for steam, or at pressures not exceeding 160 psig and temperatures not exceeding 250 degrees F for water.

Heating Season. The heating season is defined as the six (6) month period from 1 November through 30 April.

Interferences. An interference is any part of a piece of equipment, obstruction or blockage, whether installed or portable, that must be moved, removed, or disturbed in the accomplishment of work specified in this work section.

Material Condition. The overall physical state of existence of a piece of equipment and its associated components with regards to age, appearance, assembly, assessment, evaluation, and appraisal.

Power Boiler. A boiler operated at a pressure of more than 15 psig (but not more than 300 psig) for steam, or for hot water pressure of more than 160 psig or a temperature of more than 250 degrees F.

Proper Operation. The operation of a piece of equipment or system in accordance with the manufacturer's specifications and design parameters, and specifications provided by the Government.

C16.3 GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES

Refer to Section C3.

The Government will furnish all natural gas, water, and electrical power to operate boilers and all HVAC/R equipment.

C16.4 CONTRACTOR FURNISHED ITEMS

Refer to Section C4.

C16.5 FIXED PRICE WORK

The following contract requirements shall be performed per the Performance Requirements Summary (PRS), Attachment 3, Section J, at the frequencies or parameters specified within the contract requirement:

C16.5.A Trouble Calls (TC). The Contractor shall respond to all TC related to this section and accomplish any necessary repairs per Section C5.2, Firm Fixed Price Work; Trouble Calls, and Section C5.3, Firm Fixed Price Work; Recurring Services.

C16.5.B Contract Requirement No. C16-501, Boiler Daily PM, Buildings 55 and 236.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's recommendations.

Attachment(s) – 2.16.04, Section J, Boilers Inventory

PM Checklists – C16-501, Section J.

The Contractor shall perform a daily (working days only) PM on the boilers in Buildings 55 and 236 and in accordance with Contract Requirement No. C15-501, Steam Generation Operations & Distribution, and Paragraph C16.8, Detailed Specifications.

C16.5.C Contract Requirement No. C16-502; Boiler Bi-weekly.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.04, Section J, Boilers Inventory

PM Checklists – C16-503, Section J.

The Contractor shall perform a boiler bi-weekly PM and repair on the boilers included in Attachment 2.16.04, Section J, in accordance with Paragraph C16.8, Detailed Specifications.

C16.5.D Contract Requirement No. C16-503, Boiler Annual PM and Repair.

Code Compliance Standard(s) – CFR Title 24, Part 4; BAAQMD Regulation 9, Rule 7; RS Means; Manufacturer's data.

Attachment(s) – 2.16.04, Section J, Boilers Inventory

PM Checklists – C15-502, Section J.

The Contractor shall perform an annual PM and repair on the boilers listed in Attachment 2.16.04, Section J, and in accordance with Paragraph C16.8.W, Detailed Specifications; Maintenance Requirements and Procedures. NOTE: Annual "state certifications" are required for the power boilers in Buildings 55 and 236 ONLY, in accordance with Contract Requirement No. C15-503, Power Boiler Annual Certification Assistance.

C16.5.E Contract Requirement No. C16-504, Boiler Hot Water Pumps.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.05, Section J, Pumps Inventory

PM Checklists – C16-504, Section J.

The Contractor shall perform PM on the boiler hot water pumps included in Attachment 2.16.05, Section J, and in accordance with Paragraph C16.8, Detailed Specifications.

C16.5.F Contract Requirement No. C16-505, Boiler Feedwater Pumps.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.05, Section J, Pumps Inventory

PM Checklists – C16.505, Section J.

The Contractor shall perform PM on the boiler feed water pumps included in Attachment 2.16.05, Section J, and in accordance with Paragraph C16.8, Detailed Specifications.

C16.5.G Contract Requirement No. C16-506, Condensate Pumps.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.05, Section J, Pumps Inventory.

PM Checklists – C16.506, Section J.

The Contractor shall perform PM on the condensate pumps included in Attachment 2.16.05, Section J.

C16.5.H Contract Requirement No. C16-507, Chilled Water Pumps.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.05, 05, Section J, Pumps Inventory

PM Checklists – C16-507, Section J.

The Contractor shall perform PM on the chilled water pumps included in Attachment 2.16.05, Section J.

C16.5.J Contract Requirement No. C16-508, Reciprocating Type Air Conditioning (A/C) Plants.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.06, Section J, Air Conditioning Equipment Inventory

PM Checklists – C16-508, Section J.

The Contractor shall perform PM and repair on the reciprocating A/C plants included in Attachment 2.16.06, Section J. The PM shall coincide with the PM for the cooling tower at the facility.

C16.5.K Contract Requirement No. C16-509, Centrifugal and Screw Type Air Conditioning (A/C) Plants.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.06, Section J, Air Conditioning Equipment Inventory

PM Checklists – C16-509, Section J.

The Contractor shall perform PM on the centrifugal and screw A/C plants included in Attachment 2.16.06, Section J. The PM shall coincide with the PM for the cooling tower at the facility.

C16.5.L Contract Requirement No. C16-510, Air Handler Units.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.08, Section J, Air Handlers Inventory

PM Checklists – C16-510, Section J.

The Contractor shall perform PM on the air handler units included in Attachment 2.16.08, Section J. PM responsibility shall include any variable frequency drive units associated with primary fans inside the air handler units.

C16.5.M Contract Requirement No. C16-511, Exhaust Fans.

Code Compliance Standard(s) – CFR Title 24, Part 5; RS Means; Manufacturer's data.

Attachment(s) – 2.16.09, Section J, Fan and Fume Hoods Inventory

PM Checklists – C16-511, Section J.

The Contractor shall perform PM on the exhaust fans included in Attachment 2.16.09, Section J.

C16.5.N Contract Requirement No. C16-512, Fume Hoods.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.09, Section J, Fan and Fume Hoods Inventory

PM Checklists – C16-512, Section J.

The Contractor shall perform PM on the fume hoods included in Attachment 2.16.09, Section J.

C16.5.P Contract Requirement No. C16-513, Cooling Towers.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.10, Section J, Cooling Towers Inventory

PM Checklists – C16-513, Section J.

The Contractor shall perform PM and repair on the cooling towers listed in Attachment 2.16.10, Section J. PM responsibility shall include any variable frequency drive units associated with cooling tower fans shown in Attachment 2.16.08, Section J.

C16.5.Q Contract Requirement No. C16-514, Cooling Tower Circulating Pumps.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.05, Section J, Pumps Inventory

PM Checklists – C16-514, Section J.

The Contractor shall perform PM on the cooling tower circulating pumps included in Attachment 2.16.05, Section J.

C16.5.R Contract Requirement No. C16-515, Cooling Tower Water Treatment.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.11, Section J, Cooling Tower Water Treatment Inventory

PM Checklists – C16-515, Section J.

The Contractor shall perform PM on the water treatment system for the cooling towers. Water treatment equipment for cooling towers is included in Attachment 2.16.11, Section J.

C16.5.S Contract Requirement No. C16-516, Natural Gas and Propane Space Heaters.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.12, Section J, Heaters Inventory

PM Checklists – C16-516, Section J.

The Contractor shall perform PM on the natural gas and propane space heaters included in Attachment 2.16.12, Section J.

C16.5.T Contract Requirement No. C16-517, Hot Water Space Heaters.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.12, Section J, Heaters Inventory.

PM Checklists – C16-517, Section J.

The Contractor shall perform PM on hot water space heaters included in Attachment 2.16.12, Section J.

C16.5.U Contract Requirement No. C16-518, Humidifiers.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.13, Section J, Humidifiers Inventory

PM Checklists – C16-518, Section J.

The Contractor shall perform PM on the humidifiers listed in Attachment 2.16.13, Section J.

C16.5.V Contract Requirement No. C16-519, In Space Unit (ISU) Air Handler.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.08, Section J, Air Handlers Inventory

PM Checklists – C16-519, Section J.

The Contractor shall perform PM on the ISUs included in Attachment 2.16.08, Section J.

C16.5.W Contract Requirement No. C16-520, Trailer Mounted Mobile Chiller (Emergency Chiller).

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.06, Section J, Air Conditioning Equipment Inventory

PM Checklists – C16-520, Section J.

The Contractor shall perform a monthly PM on the trailer mounted mobile chiller included in Attachment 2.16.06, Section J.

C16.5.X Contract Requirement No. C16-521, Resin Filtration System.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.20.07, Section J, Water Treatment and Disposal Information

PM Checklists – C16-521, Section J.

The Contractor shall perform a monthly PM on the resin filtration system included in Attachment 2.20.07, Section J. The unit is designed to filter processed water and shall be used for treatment of processed water from boilers, cooling towers, and chillers. The Contractor shall set up and maintain pumps, piping, ion exchange columns, and activated charcoal containers. The Unit is composed of a pre-filter (75 microns), de-ionization filters, and is skid mounted for portability. The Unit shall be checked before each operation for damage or debris build-up to the pump, motor, filters, hoses, gauges, and fittings. The Contractor shall pump water through the pre-filter for a designated period of time, then pump all the pre-filtered water through the de-ionization filters for another designated period of time.

C16.5.Y Contract Requirement No. C16-522, Water Treatment for Chilled Water Systems.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.11, Section J, Cooling Tower Water Treatment Inventory

PM Checklists – C16-522, Section J.

The Contractor shall perform water treatment PM for the chilled water systems listed in Attachment 2.16.11, Section J.

C16.5.Z Contract Requirement No. C16-523, Water Treatment for Hot Water Boilers.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.04, Boilers Inventory; 2.16.11, Section J, Cooling Tower Water Treatment Inventory

PM Checklists – C16-523, Section J.

The Contractor shall perform water treatment PM for the hot water boilers. Water treatment equipment is listed in Attachment 2.16.11, Section J, and hot water boilers are included in Attachment 2.16.04, Section J.

C16.5.AA Contract Requirement No. C16-524, Water Treatment for Steam Boilers.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.04, Boilers Inventory; 2.16.11, Section J, Cooling Tower Water Treatment Inventory

PM Checklists – C16-524, Section J.

The Contractor shall perform water treatment PM for the steam boilers. Water treatment equipment is listed in Attachment 2.16.11, Section J, and steam boilers are included in Attachment 2.16.04, Section J.

C16.5.AB Contract Requirement No. C16-525, Electric Duct Heater.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.12, Section J, Heaters Inventory

PM Checklists – C16-525, Section J.

The Contractor shall perform PM on the electric duct heaters included in Attachment 2.16.12, Section J.

C16.5.AC Contract Requirement No. C16-526, Automatic Lubricators.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.16, Section J, Automatic Lubricators Inventory

PM Checklists – C16-526, Section J.

The Contractor shall perform an annual PM for all the automatic lubricators associated with the mechanical equipment in this section. A listing of automatic lubricators currently in operation is shown in Attachment 2.16.16, Section J.

C16.5.AD Contract Requirement No. C16-527, Air Filters.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.14, Section J, Filters Inventory

PM Checklists – C16-527, Section J.

The Contractor shall perform PM for all the air filters listed in Attachment 2.16.14, Section J.

C16.5.AE Contract Requirement No. C16-528, Annual Building Shutdown.

Code Compliance Standard(s) – Ames Building Standard

Attachment(s) – N/A

PM Checklists – C16-528 A, B, and C, Section J.

The Contractor shall accomplish an annual PM for Buildings 233, 233A, and 258, excluding boilers. These shutdowns shall include all equipment in those particular buildings at a specified time, usually lasting between two (2) calendar days and five (5) calendar days. These shutdowns usually occur between 15 December and 31 March. All shutdown timeframes and scheduling shall be coordinated with the COTR, Facility Service Managers (FSM), and the building representatives. After completion of the annual building shutdowns, a summary report shall be submitted to the COTR describing what events occurred and any problems or discrepancies found during the PM.

C16.5.AF Contract Requirement No. C16-529, Steam Space Heaters.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.12, Section J, Heaters Inventory

PM Checklists – C16-529, Section J.

The Contractor shall perform PM on steam space heaters included in Attachment 2.16.12, Section J.

C16.5.AG Contract Requirement No. C16-530, Electric Space Heaters.

Code Compliance Standard(s) – CFR Title 24, Part 4; RS Means; Manufacturer's data.

Attachment(s) – 2.16.12, Section J, Heaters Inventory

PM Checklists – C16-530, Section J.

The Contractor shall perform PM on electric space heaters included in Attachment 2.16.12, Section J.

C16.5.AH Contract Requirement No. C16-531, Refrigerator/Freezer Walk-In Units.

Code Compliance Standard(s) – CFR Title 24; RS Means; Manufacturer's data.

Attachment(s) – 2.16.15, Section J, Refrigerators/Freezers Walk-In Inventory

PM Checklists – C16-531, Section J.

The Contractor shall perform PM on refrigerator/freezer walk-in units included in Attachment 2.16.15, Section J. PM's shall be completed after business operating hours are closed for the day.

C16.6 DOCUMENTATION AND REPORTING REQUIREMENTS

C16.6.A Contract Requirement No. C16-601, Boiler Bi-weekly PM Status Report. The Contractor shall provide one (1) electronic copy of a status report bi-weekly to the COTR listing the results and status of all work accomplished.

C16.6.B Contract Requirement No. C16-602, Boiler and Chiller Annual PM Report. The Contractor shall provide one (1) electronic copy and two (2) legible hard copies listing the results and status of all work accomplished during the annual PM. The report shall include the data taken before and during the most recent PM, any problems or corrective actions taken, boiler tuning results, and any recommendations for returning the boiler or chiller to safe and proper operation. The Contractor shall also provide a copy of the annual state certifications for all power boilers.

C16.6.C Contract Requirement No. C16-603, Calibration Report. The Contractor shall provide one (1) monthly electronic copy to the COTR of all calibrated gauges and thermometers. Include location, date calibrated, and next calibration date.

C16.6.D Contract Requirement No. C16-604, Chemical Water Treatment Report. The Contractor shall provide annually a chemical water treatment report to the COTR. Report shall state why selected chemicals are used at each location, and processes and procedures in effect to control corrosion, the growth of algae, viruses, and all other micro-biological growth in industrial water systems. Recommendations for improvement, if any, shall be annotated.

C16.7 INDEFINITE DELIVERY INDEFINITE QUANTITY WORK

Indefinite delivery indefinite quantity (IDIQ) work will be ordered in accordance with Section C7, Indefinite Delivery Indefinite Quantity Work, and may be ordered for any facility or area at Moffett Field involving HVAC/R and Boiler Maintenance and Repair. Maintenance, repair, or minor construction IDIQ work shall be completed within the number of days specified on the Contract Task Order (CTO).

C16.7.A Repair Leaking Joints. The Contractor shall accomplish the repairs of leaking soldered, welded, mechanical, and condenser tube roll joints per the CTO. All gaskets and fasteners removed shall be replaced with new gaskets and fasteners of equal or better quality.

- C16.7.B Valve Seats, Bonnets, Packing Areas, and Diaphragms. The Contractor shall repair leaking valve seats, bonnets, and valve packing areas in place, and change leaking regulating valve diaphragms per the CTO.
- C16.7.C Gate Valve(s). The Contractor shall perform the following:
- C16.7.C.1 Gate Valve Overhaul. The Contractor shall remove the existing valve and overall valve per the CTO.
- C16.7.C.2 Gate Valve Replacement. The Contractor shall remove the existing valve and install new gate valve per the CTO.
- C16.7.D Globe Valve(s). The Contractor shall perform the following:
- C16.7.D.1 Globe Valve Overhaul. The Contractor shall remove the existing valve and overall valve per the CTO.
- C16.7.D.2 Globe Valve Replacement. The Contractor shall remove the existing valve and install new globe valve per the CTO.
- C16.7.E Butterfly Valve(s). The Contractor shall perform the following:
- C16.7.E.1 Butterfly Valve Overhaul. The Contractor shall remove the existing valve and overall valve per the CTO.
- C16.7.E.2 Butterfly Valve Replacement. The Contractor shall remove the existing valve and install new butterfly valve per the CTO.
- C16.7.F Copper Tubing. The Contractor shall remove the existing tubing and install new copper tubing and associated fittings per the CTO.
- C16.7.G Steel Pipe. The Contractor shall remove the existing pipe and install new seamless steel pipe and associated fittings per the CTO.
- C16.7.H Pipe Insulation. The Contractor shall remove the existing insulation and install new pipe insulation per the CTO. Replacement materials shall be selected per paragraph C16.8.U.
- C16.7.J Pressure Gauge Replacement. The Contractor shall remove the existing gauge(s) and install new pressure gauge(s) per the CTO.
- C16.7.K New Gauge Installation. The Contractor shall install new gauge(s) per the CTO.

C16.8 DETAILED SPECIFICATIONS

The Contractor shall accomplish the following detailed specifications and requirements in accomplishing work required by this work section:

- C16.8.A Safety and Environment. The Contractor shall abide by all Federal, State, and local regulations with respect to personnel safety and environmental protection and in accordance with Section C20, Environmental and Emergency Support Services.
- C16.8.B Interferences. The Contractor shall remove and reinstall interferences necessary to accomplish work required by this work section.

- C16.8.C Forms. The Contractor shall obtain, complete, and adhere to all NASA ARC required permit forms such as: Burn permit, confined space entry permit, and all lock-out, tag-out procedures in accordance with Section C20, Environmental and Emergency Support Services.
- C16.8.D Shutdown of Heating and Air Conditioning Equipment. Prior approval shall be obtained from the COTR for unscheduled work requiring shutdown of any equipment for over 60 minutes during regular work hours, except for an emergency. Whenever possible, maintenance requiring shutdown of equipment for more than 60 minutes shall be performed when winter heating or summer cooling is not required.
- C16.8.E Operation of Certified Boilers. The Contractor shall not operate any power boiler that does not have a valid annual State Inspection Certificate. The Contractor shall be responsible for obtaining the certificate before operation. The COTR shall be notified if unsafe conditions are found following repair of a pressurized component, after any major modification to boilers, control equipment, or associated components. The affected equipment shall not be placed back in operation until written authorization is received from the Government.
- C16.8.F Temperature Settings for HVAC/R Equipment and Systems. The Contractor shall maintain temperature settings for HVAC/R equipment and systems during performance of work as specified in this section. The Contractor shall operate every boiler, every day, and some on weekends, during the heating season, in accordance with the boiler-firing schedule in the FMCS. This work shall be performed in conjunction with FMCS control and monitoring programs. The majority of buildings shall be maintained at a comfortable heating temperature range of between 65 degrees F to 75 degrees F and a comfort cooling range of between 68 degrees F and 78 degrees F as desired by the occupants and their requirements. Buildings 233, 233A, 254, and 258 infrastructure support rooms shall be maintained at 68 degrees F, ± 2 degrees F.
- C16.8.G Environmental Safety and Health Services. The Contractor shall handle all hazardous materials and environmental work associated with, or arising from, this work section, in accordance with the requirements of Section C20, Environmental and Emergency Support Services.
- C16.8.H Pressure Testing. The Contractor shall accomplish pressure testing for leaks when repairs or alterations are made involving the integrity of refrigerant, steam, hot water, feed water, chilled water, condenser water or make-up water systems while conducting maintenance and repair. Pressure levels, duration, and test setup shall be accomplished per the NASA pressure systems standard testing requirements. If the repair is made to a buried section of the system, the pressure test shall be accomplished prior to covering the repaired area. Allowable leakage: NONE.
- C16.8.J Structural Support Systems. The Contractor shall accomplish the repair or replacement of pipe hangers, supports, expansion loops, guy wires, anchor rods, screw anchors, turnbuckles, motor mounts, fasteners, and anchors while conducting maintenance and repair.
- C16.8.K Valves. The Contractor shall repair or replace deteriorated, damaged, and leaky valves, stems, disks, seals, packing, bonnets, and gaskets. If a valve requires disassembly for repair, the Contractor shall, while the valve is disassembled, clean the bonnet, lubricate the stem, and inspect the valve for signs of deteriorated or damaged packing and broken, bent, corroded, or missing parts. After the valve is restored, the Contractor shall apply system pressure to ensure all joints are sealed, and check for seat, body, and packing leaks, and check for proper operation, correcting any defects found. The Contractor shall apply anti-seize compound conforming to MIL-A-907 to gasket surfaces and moving parts. All valves under two (2) inches shall be replaced with new valves, not repaired, if found defective by the Contractor.

- C16.8.L Expansion Joints. The Contractor shall accomplish the replacement of deteriorated, damaged, and leaky expansion joints, associated fasteners, and insulation. The new expansion joints shall be installed with new fasteners and insulation. Apply anti-seize compound conforming to MIL-A-907 to new fasteners.
- C16.8.M Traps and Y-Type Strainers. The Contractor shall repair or replace all defective parts of traps and Y-type strainers such as baskets, plugs, gaskets, bellows, floats, valves, valve seats, hooks, buckets, linkages, and strainer orifices. If repair requires disassembly, the Contractor shall clean, inspect, and test the trap or strainer in the same manner as valves. The Contractor shall test traps and strainers to determine correct operation, without breaking insulation. The Contractor shall apply anti-seize compound conforming to MIL-A-907 to gasket surfaces and moving parts.
- C16.8.N Fasteners; Steam, Condensate, and Hot Water. When required due to deterioration, damaged threads, missing fasteners, or new installations, the Contractor shall remove the existing fastener and or install new fasteners that conform to MIL-S-1222, TYPE IV, GRADE B-7, alloy steel for threaded studs or bolts. New nuts shall conform to MIL-S-1222, TYPE I, GRADE 2-H, carbon steel. Apply high temperature anti-seize compound conforming to MIL-A-907 to all boiler and associated fasteners.
- C16.8.P Fasteners; Potable Water, Chilled Water, or Condenser Water. When required due to deterioration, damaged threads, missing fasteners, or new installations, the Contractor shall remove the existing fastener and/or install new fasteners that conform to MIL-S-1222, GRADE 655 or 661, silicon bronze for bolts, studs, and nuts.
- C16.8.Q Gaskets. When required, the Contractor shall install new gaskets conforming to the manufacturer's specifications and or the latest code and industry standards for "boiler water sides" and "boiler fire sides". Apply high-temperature anti-seize compound conforming to MIL-A-907 to boiler gasket mating surfaces. The Contractor shall install new gaskets conforming to FS HH-B-151, cloth inserted rubber or MIL-G-1149, synthetic rubber on potable water, chilled water, or condenser water systems.
- C16.8.R Gauge and Thermometer Calibration. The Contractor shall have all system gauges and thermometers professionally calibrated at least once per year to a transfer measurement standard to the manufacturer's requirements. Each gauge and thermometer shall be affixed with a calibration label denoting the name and location of the calibration facility, calibration date, and calibration due date. Equipment that fails calibration shall be replaced with new at time of discovery.
- C16.8.S Water Treatment. The Contractor shall provide chemical water treatment to control corrosion, the growth of algae, viruses and all other micro-biological growth to: Steam and hot water boilers and their associated systems, chilled water systems, cooling towers and condenser water systems. All water treatment shall conform to the latest requirements of the cities of Sunnyvale and Palo Alto, CA for water discharge. See Attachment 2.20.05, Section J, for wastewater discharge permits. Water treatment chemicals containing chromium, copper, or tributyltin shall not be used. The Contractor shall use a chemical system that incorporates the use of stationary, double-contained chemical containers that are filled from a truck and hose fill system without removing the existing containers from their parent locations. Storage of bulk chemicals for water treatment shall not be allowed on Government property.
- C16.8.T Refrigerants. The Contractor shall accomplish the use, handling, holding, cleaning, reclaiming, recycling, disposing, modifying, repairing, and testing of all refrigerants and refrigerant systems in accordance with all applicable Federal, State, local, EPA and ASHRAE regulations. Refrigerant usage by type over the last five (5) years is shown in Attachment 2.16.07, Section J. A Universal level certified technician shall perform all work involving refrigerants.

- C16.8.U Pipe Insulation. The Contractor shall repair or replace damaged pipe insulation as found or caused in accomplishing PM or repair. The Contractor shall notify the COTR of any work requiring the removal of any insulation required to accomplish other PM or repair to equipment and components. When repairing or replacing insulation, the Contractor shall inform their personnel of the possible hazards of asbestos and shall comply with the requirements set forth in accordance with Section C20, Environmental and Emergency Support Services. In addition, the Contractor shall comply with the latest revisions of ASTM C552 for cellular glass insulation above ground or ASTM C547, ASTM C553, ASTM C592, and ASTM C612 for mineral fiber insulation. It is the responsibility of the Contractor to establish appropriate safety and health practices and determine applicability of regulatory limitations prior to use of a specific product. All replacement pipe insulation shall be calcium silicate with minimum thickness as follows:

<u>Pipe Size (in):</u>	<u>Insulation thickness (in):</u>
2 and under	1.5
Over 2 through 5	2.0
Over 5 through 10	2.5

All chilled water and refrigerant piping shall be insulated with elastomeric cellular foam in the following minimum thickness:

<u>Pipe Size (in):</u>	<u>Insulation thickness (in):</u>
2 and under	0.5
Over 2 through 5	0.75
Over 5 through 10	1.0

- C16.8.V Painting. The Contractor shall prepare, prime, and paint all new and disturbed surfaces to match the surrounding surfaces, as a result of the requirements of this work section in accordance with Section C13.8.D, Buildings and Structures Maintenance, Repairs and Alterations; Detailed Specifications; Painting, and Section C20, Environmental and Emergency Support Services.

- C16.8.W Maintenance Requirements and Procedures. The Contractor shall maintain all equipment in optimum operating condition and control. All HVAC/R systems shall be operational, functional, and ready to respond to demand according to its design purpose and intent. For any unscheduled outages, the HVAC/R systems listed in Attachments 2.16.01 and 2.16.02, Section J, shall be non-functional no longer than those occurrences and times specified in Attachment 2.16.03, Section J, herein referred to as the "outage limit", except for scheduled or planned outages. For work that exceeds the TC limit, the time expended by the Contractor prior to the Contractor notifying the COTR of such condition shall be applied towards the outage limit. All other time will not be counted towards the outage limit for work exceeding the TC limit. Planned outages for maintenance and repair shall follow standard labor hours and practices per the R.S. Means® Facilities Maintenance and Repair Cost Data Handbook. Any time exceeding published labor hours may count towards the outage limit.

The actual boiler-firing efficiencies shall be in accordance with Contract Requirement No. C15-501, Steam Generation Operations & Distribution; Boiler Combustion Limits. Chillers shall be operated based on seasonal demand to provide for maximum chiller life and minimal operational costs. The maintenance procedures shall be prepared by the Contractor per the following order as applicable: (1) Manufacturer's instructions; (2) industry standards and codes, (3) Federal, State, and local regulations; and (4) procedures outlined in NASA publications. The Contractor shall keep all records and procedures orderly, readily accessible, and simply referenced so they can be quickly accessed by all authorized Government authorities at any time. As a minimum, the procedures shall include:

- C16.8.W.1 Equipment operating procedures including start-up, on-line or running parameters, shutdown, emergency, and lay-up procedures.
- C16.8.W.2 Plant systems and equipment PM procedures.
- C16.8.W.3 Troubleshooting procedures for major equipment and systems.
- C16.8.W.4 Corrective maintenance and repair procedures.
- C16.8.W.5 Clearly defined qualifications, duties, and responsibilities.

END OF SECTION C16

SECTION C17**ELECTRICAL DISTRIBUTION AND EMERGENCY GENERATING SYSTEMS MAINTENANCE AND REPAIR****C17.1 GENERAL REQUIREMENTS**

- C17.1.A General Intention. The Contractor shall provide all labor, management, supervision, tools, materials, equipment, incidental engineering, and transportation to operate, maintain and repair all low-voltage electrical distribution systems, street and perimeter lighting systems, airfield lighting systems, electrical support of the high-voltage systems at Ames Research Center (ARC), and emergency generation systems at ARC and Moffett Airfield Complex (MAC), as described. In addition, the Contractor will be responsible for all maintenance and operations on all high voltage 2.4KV and 12KV distribution systems located at MAC and Moffett Housing Annex 2 (MHA-2), and maintenance (no operations) of all 7.2 KV and 13.8 KV high voltage electrical distribution systems located at ARC. High-voltage electrical distribution includes all facility electrical distribution systems over 600 volts such as overhead and underground transmission and distribution lines from the Pacific Gas and Electric (PG&E) connection and delivery points to all main service load centers excluding ARC in buildings as shown on the Primary Electrical Distribution Maps located in the Technical Reference Library (TRL), including substations and accessories. The Contractor shall be directly responsible for: (1) Generators as shown in Attachment 2.17.02, Section J; (2) Transformers as listed in Attachment 2.17.04, Section J; (3) Uninterrupted power supplies as listed in Attachment 2.17.05, Section J; (4) Storage of batteries and battery chargers for direct current power in substations as listed in Attachment 2.17.06, Section J; (5) Switch Gear as listed in Attachment 2.17.07, Section J; (6) MCC and electrical panel boards shown in Attachment 2.17.08, Section J; (7) Transfer panels shown in Attachment 2.17.09, Section J; (8) Electrical manholes as listed in Attachment 2.17.10, Section J; (9) Electrical devices and equipment associated with the electrical distribution system provided under this contract and as listed in Attachment 2.17.11, Section J; and (10) Exterior lighting systems, including street, flood, airfield, perimeter, and security lighting as shown on the electrical distribution maps located in the TRL.
- C17.1.B Emergency Requirements: Loss of Primary Power. Following a complete loss of primary power, the Contractor shall confirm that existing emergency generating equipment is on-line. The Contractor shall be notified and be required to respond as an emergency trouble call (TC). After PG&E or the Government restores primary power, the Contractor shall confirm that all emergency generating equipment has returned to normal as part of the same TC.
- C17.1.C Two-Person Safety Rule. In the following situations, the Contractor shall provide at least two (2) people to work together per OSHA standards: One (1) trained person shall recognize electrical hazards, watch the movements of those performing the tasks, and warn the other(s) of impending danger or assist in the event of emergency. The following are possible examples of situations requiring this rule:
- C17.1.C.1 Work on energized overhead lines.
 - C17.1.C.2 Work in substations where the wiring is congested.
 - C17.1.C.3 Work at remote or isolated locations.
 - C17.1.C.4 Work at night or during inclement weather conditions.
 - C17.1.C.5 Work involving handling energized conductors or apparatus.
 - C17.1.C.6 Confined space entry.

C17.1.C.7 Work on non-sealed storage batteries inside substation areas.

C17.2 DEFINITIONS

Refer to Section C2.

Material Condition. The overall existing physical state of existence of a piece of equipment and its associated components with regards to age, appearance, assembly, assessment, evaluation, and appraisal.

C17.3 GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES

Refer to Section C3.

The Government will furnish biodiesel and diesel No. 2 fuel for all Government fixed and mobile emergency generators.

C17.4 CONTRACTOR FURNISHED ITEMS

Refer to Section C4.

Contractor shall be responsible for transportation of fuel for all generators.

C17.5 FIXED PRICE WORK

The following Contract Requirements shall be performed per the Performance Requirements Summary (PRS) Attachment 3, Section J, at the frequencies or performance criteria specified within the contract requirement:

C17.5.A Trouble Calls (TC). The Contractor shall respond to all TC related to this section and accomplish any necessary repairs per Section C5.2, Firm Fixed Price Work; Trouble Calls.

C17.5.B Contract Requirement No. C17-501, Fixed Emergency Generator Systems.

Code Compliance Standard(s) – BAAQMD Permits; NFPA 110

Attachment(s) – 2.17.02, Section J, Generators Inventory

PM Checklists – C17-501, Section J.

The Contractor shall perform PM on all fixed emergency generator systems as shown in Attachment 2.17.02, Section J. Perform a visual inspection on all emergency generating equipment fuel oil tanks for material condition and adequate fluid levels, and add fluids as necessary. The Contractor shall ensure there is suitable fuel to operate all emergency generating equipment, maintain and repair all belts and leak detection monitoring systems on fuel tanks, and maintain all fuel oil handling equipment including storage tanks, monitoring systems, pumps, piping, and heaters. The Contractor shall check proper operation of the generators starting and running them under no load and no transfer conditions until normal engine operating temperature is achieved. The frequency shall be measured for proper output. Refer to Paragraph C17.8.D, Performance, for performance criteria.

For the annual PM, check for proper operation of the generators under loaded conditions, perform visual inspection and infrared scan on transfer panel, change oil filters, and

coordinate timing of PM with the Government load station maintenance schedule. Refer to Paragraph C17.8.D, Performance, for performance criteria.

C17.5.C Contract Requirement No. C17-502, Portable Emergency Generator Systems.

Code Compliance Standard(s) – BAAQMD Permits; NFPA 110

Attachment(s) – 2.17.02, Section J. Generators Inventory

PM Checklists – C17-502, Section J.

The Contractor shall transport; connect and disconnect; and operate portable generators during planned and unplanned power outages at various structures and remote locations when no normal source of power is available. The Contractor shall maintain the portable emergency generators as listed in Attachment 2.17.02, Section J, in an operational state for immediate use. A load test of these generators shall be performed annually. The generators historically have been used under loaded conditions three (3) times a year, on average. The Government may provide emergency generators when available. When the Government provided emergency generators are not available, the Contractor shall provide emergency generators under the indefinite delivery indefinite quantity section of this contract. Refer to Paragraph C17.8.D, Performance, for performance criteria.

C17.5.D Contract Requirement No. C17-503, Transfer Panels.

Code Compliance Standard(s) – NEC; RS Means; Manufacturer's Data; NFPA 110

Attachment(s) – 2.17.09, Section J, Transfer Panel Inventory

PM Checklists – C17-503, Section J.

The Contractor shall visually inspect all automatic transfer panels on an annual basis, perform an infrared scan under load on the transfer panel biennially, and transfer load to the panel from the running generator triennially. A list of panels is available in Attachment 2.17.09, Section J. Refer to Paragraph C17.8.D, Performance, for performance criteria.

C17.5.E Contract Requirement No. C17-504, Batteries and Battery Chargers.

Code Compliance Standard(s) – NFPA 70B; RS Means; Manufacturer's Data

Attachment(s) – 2.17.06, Section J, Battery and Battery Chargers Inventory

PM Checklists – C17-504, Section J.

The Contractor shall perform PM on batteries and battery chargers on an annual basis on all emergency generators and components inside all electrical substation areas. The PM must include all previous procedures included in the monthly PM plus perform a battery test, thoroughly clean all terminals, and re-coat terminals with anti-oxidation compound. Refer to Paragraph C17.8.D, Performance, for performance criteria.

C17.5.F Contract Requirement No. C17-505, Transformers.

Code Compliance Standard(s) – NFPA 70B; RS Means; Manufacturer's Data

Attachment(s) – 2.17.04, Section J, Transformers Inventory

PM Checklists – C17-505 A, B, Section J; C17-506, Section J.

The Contractor shall perform a visual inspection of each transformer in use, or stored for reuse, and provide general cleaning of the equipment and area on a quarterly basis. All transformers are listed in Attachment 2.17.04, Section J. The visual inspection must include investigation for any leak of dielectric fluid on or around the transformer and any pressure or temperature gauges that are not in service per its intended function. If leaks are present, provide clean-up services and containment, if possible. Inspect leaking PCB and PCB contaminated transformers daily until unit is repaired or replaced. Replace any damaged or non-functioning gauges. The extent of the inspections will depend on the physical constraints

of each transformer installation and should not require an electrical shutdown of the transformer being inspected. Inspect all transformers that are in service including PCB containing and PCB contaminated transformers. The transformer inspections will also note the following elements:

- C17.5.F.1 The presence of the appropriate labeling on both the transformer, and the access to the transformer. If there is no labeling, or the labeling is in error, contact the COTR.
- C17.5.F.2 The presence of any debris within 15 feet of the transformer. If combustible materials are present, identify and provide cleanup as required per applicable codes and requirements, and notify the COTR of findings.
- C17.5.F.3 The presence of secondary containment around the transformer, condition of containment, and current status of any fluids or debris inside.
- C17.5.F.4 Proper fan operation on forced air-cooled transformers.
- C17.5.F.5 For annual PM, perform oil testing through an independent laboratory. Test all transformers that are in service including PCB containing and PCB contaminated transformers. Test to include gas in oil analysis, power factor, Karl Fisher, inhibitor, oil screen, and metals.
- C17.5.G Contract Requirement No. C17-506, Substation Inspections.
Code Compliance Standard(s) – NFPA 70B; Manufacturer's Data
Attachment(s) – N/A
PM Checklists – C17-506, Section J.
The Contractor shall perform a weekly PM on all equipment that is located inside the fenced areas of Substations 225, 225B, 227, 104, 590, and 591, plus Switch Gear B at Hangar 3 and Switch Gear D at Hangar 2 Vault 4. When pumping water from manholes for inspection, water without a sheen shall be pumped to a vegetated area. Water with a sheen needs to be containerized, tested by Code JQ, and disposed of properly.
- C17.5.H Contract Requirement No. C17-507, Relay Calibration. (NIC)
Code Compliance Standard(s) – NFPA 70B; Manufacturer's Data
Attachment(s) – N/A
PM Checklists – C17-507, Section J.
The Contractor shall perform PM on all relay circuits. PM shall include an annual infrared scan with documentation. Recalibrate as necessary and document results in database.
- C17.5.J Contract Requirement No. C17-508 Building Switch Gear.
Code Compliance Standard(s) – NFPA 70B; RS Means; Manufacturer's Data
Attachment(s) – 2.17.07, Section J, Switchgear Inventory
PM Checklists – C17-508, Section J.
The Contractor shall perform an inspection on all electrical switchgears at the facilities listed in Attachment 2.17.07, Section J. Visually check all circuit breakers, indicating lights on circuit breakers, and protective relay health light. Provide general cleaning of all equipment and area surrounding the equipment. Refer to Paragraph C17.8.D, Performance, for performance criteria.
- C17.5.K Contract Requirement No. C17-509, Street and Perimeter Lighting.

Code Compliance Standard(s) – RS Means

Attachment(s) – 2.17.13, Section J, Street and Perimeter Lighting

PM Checklists – C17-509, Section J.

The Contractor shall inspect, on a regular basis, all street and perimeter lighting systems as shown on the electrical distribution maps located in the TRL. Perimeter lighting includes all lights intended for building egress safety and lights in or intended to illuminate vehicle parking lot areas. Inspections shall take place after dark to locate inoperative fixtures. The Contractor shall re-lamp all burned out street and perimeter light fixtures and repair or replace all broken fixtures. Any inoperative fixtures reported to the Contractor by a TC shall be placed back in service within the allowed times shown in the availability requirements table located in Attachment 2.17.03, Section J.

C17.5.L Contract Requirement No. C17-510, Airfield Lighting.

Code Compliance Standard(s) – FAA AC No. 150/5340-26A

Attachment(s) – 2.17.12, Section J, Airfield Runway Lights

PM Checklists – C17-510, Section J.

The Contractor shall perform PM on the MAC runway lighting system that uses 2400 volts, all airfield related lights that include obstruction lights on fences, buildings, and other structures, and beacon and distance indicators. Refer to Paragraph C17.8.D, Performance, for performance criteria.

C17.5.M Contract Requirement No. C17-511, Uninterrupted Power Supply Systems.

Code Compliance Standard(s) – NFPA 70B; RS Means; Manufacturer's Data

Attachment(s) – 2.17.05, Section J, Power Supply Inventory

PM Checklists – C17-511, Section J.

The Contractor shall perform PM on the uninterrupted power supply systems for Buildings 254, 258, 262, 269, and 510 related to the electrical distribution system. A list is available in Attachment 2.17.05, Section J. Refer to Paragraph C17.8.D, Performance, for performance criteria.

C17.5.N Contract Requirement No. C17-512, Substation Insulator Wash.

Code Compliance Standard(s) – PG&E; NFPA 70B; Manufacturer's Data

Attachment(s) – N/A

PM Checklists – C17-512, Section J.

The Contractor shall perform an annual PM to wash the substation insulators. All 115KV substations shall be energized while cleaning insulators. Dry clean insulators at substations located at facilities 221C, 225, 225B, 227, 238, and 591.

C17.5.P Contract Requirement No. C17-513, Electrical Manhole Inspections.

Code Compliance Standard(s) – NFPA 70B; Manufacturer's Data

Attachment(s) – 2.17.10, Section J, Electrical Manholes Inventory

PM Checklists – C17-513, Section J.

The Contractor shall perform PM on all MAC and MHA electrical manholes listed in Attachment 2.17.10, Section J. Inspections shall include infrared scan of all medium voltage cables inside the manholes, and general cleaning of manhole and sump. Check manhole covers and labeling, and repair covers or re-label as necessary.

C17.5.Q Contract Requirement No. C17-514, MCC and Main Panel Boards.

Code Compliance Standard(s) – RS Means

Attachment(s) – 2.17.08, Section J, MCC and Main Panel Boards Inventory

PM Checklists – N/A

The Contractor shall perform PM on all MCC and panel boards above 225A listed in Attachment 2.17.08, Section J. PM shall include an annual infrared scan with documentation. Repair any missing cover and fastening hardware, and/or re-label as necessary.

C17.5.R Contract Requirement No. C17-515, Electrical Maintenance Support.

Code Compliance Standard(s) – NFPA 70E

Attachment(s) – N/A

PM Checklists – N/A

The Contractor shall provide high voltage electrical labor on maintenance tasks in support of Government electricians performing maintenance and repair tasks on Moffett Field. Requirement is for labor up to 40 hours per year that could be called upon to support at any time during the year. Notification will be given at least 24 hours in advance of support work.

C17.6 DOCUMENTATION AND REPORTING REQUIREMENTS

C17.6.A Contract Requirement No. C17-601, Transformer Quarterly Report. The Contractor shall submit one (1) electronic copy of a transformer report quarterly to the COTR. The report shall contain the elements listed in Contract Requirement No. C17-507, Transformers Quarterly PM, and verbiage as to its material condition and operational status.

C17.6.B Contract Requirement No. C17-602, Transformer Annual Report. The Contractor shall submit one (1) electronic copy and two (2) hard copies of the transformer report annually to the COTR. The report shall contain the elements listed in Contract Requirement No. C17-508, Transformers Annual PM, and shall include identifying photograph of the transformer, the laboratory analytical results on the oil tests, and verbiage as to its material condition and operational status.

C17.6.C Contract Requirement No. C17-603, Generators Operating Hours Monthly Report. The Contractor shall submit a monthly report electronically to the COTR showing the operating hours of all fixed and portable generators maintained under this contract. Show current month usage for emergency and maintenance category use along with total hours operated since activation.

C17.6.D Contract Requirement No. C17-604, Generators Monthly Inspection Report. The Contractor shall submit a monthly report electronically to the COTR documenting inspection results of all fixed and portable generators maintained under this contract.

C17.6.E Contract Requirement No. C17-605, Generators Annual Inspection Report. The Contractor shall submit one (1) electronic copy and two (2) hard copies of the generator report annually to the COTR documenting inspections of all fixed and portable generators maintained under this contract, and shall include verbiage of any discrepancies and resolutions. Include results of infrared scans and auto transfer panel tests in year when required.

C17.6.F Contract Requirement No. C17-606, Discrepancy Report. The Contractor shall submit electronically to the COTR a brief discrepancy report related to the high voltage electrical distribution systems including building emergency generators and substation batteries for which the Contractor has responsibility over within 48 hours upon discovery of any discrepancy. In addition, the Contractor shall annotate any substantial (feeders, floors or

wings of buildings, mechanical rooms, etc.) power outages occurring on the Center affecting buildings or facilities.

C17.7 INDEFINITE DELIVERY INDEFINITE QUANTITY WORK

Indefinite delivery indefinite quantity (IDIQ) work will be ordered in accordance with Section C7, Indefinite Delivery Indefinite Quantity Work, and completed within the number of calendar or workdays specified in the Contract Task Order (CTO).

- C17.7.A Provide and Run On-Site Portable Generators. The Contractor shall provide, transport, connect, run, document, and disconnect GFE three (3) phase alternating current portable generators of various sizes. The Contractor shall provide all maintenance, repair, fueling service, secondary containment, etc. required for the continuous operation of the generator until no longer required. The Contractor shall restore normal power upon disconnecting the portable generators and return the generators to the original storage location. The Contractor shall provide the emergency generator within 24 hours of notification by the COTR.
- C17.7.B Operate Rental Portable Generators. The Contractor shall rent, connect, run, and disconnect rental portable generators of various sizes. The Contractor shall provide for all maintenance, repair, fueling service, secondary containment, requisite documentation, etc. required for the continuous operation of the rental generator until no longer required. The Contractor shall restore normal power upon disconnecting the portable generators and provide for the return of the generators to the rental company. The Contractor shall provide the emergency generator within 24 hours of notification by the COTR.
- C17.7.C Portable Emergency Generators PM. The Contractor shall perform PM on other portable emergency generators not listed in paragraph C17.5.E per the procedures stated in the R.S. Means® Facilities Maintenance and Repair Cost Data.
- C17.7.D Repair High Voltage Cables and Components. The Contractor shall repair or replace high voltage cables and components per the CTO. Work entails removing old cables in conduits and pulling in new single and/or multiple conductor wires, terminating end points with proper devices, and labeling. Work may include installing new underground conduits if insufficient capacity exists.

C17.8 DETAILED SPECIFICATIONS

- C17.8.A Emergency Generators. The Contractor shall make all necessary repairs to emergency generating equipment and ancillary component equipment, including diesel engines, on a priority basis. The Contractor shall work continuously to repair the disabled system and shall provide the COTR with daily reports of progress until all repairs and tests are complete. The Contractor shall transport used oil in Government furnished containers to the Moffett Field hazardous waste transfer site for disposal.
- C17.8.B Batteries and Battery Chargers. The Contractor shall maintain, repair, or replace batteries and battery chargers of 12 and 24 volts on emergency generators, and up to 130 volts for UPS systems in Substations 225, 225B, Switch gear A, Switch gear C, and Switch gear 104. All batteries in service shall be maintained in a 100 percent working order. The Contractor shall transport spent batteries to the Moffett Field hazardous waste transfer site for disposal.
- C17.8.C Storage Batteries. The Contractor shall maintain, repair, or replace batteries in storage per the manufacturer's recommendations.

- C17.8.D Performance. All equipment shall be operational, functional, and ready to respond to demand according to its designed purpose and intent except for scheduled or planned outages. For unscheduled outages, the electrical systems under this section shall be down no longer than a total of eight (8) hours per month, herein referred to as the "outage limit". For work that exceeds the TC limit, the time expended by the Contractor prior to the Contractor notifying the COTR of such condition shall be applied towards the outage limit. All other time will not be counted towards the outage limit for work exceeding the TC limit. Planned outages for maintenance and repair shall follow standard labor hours and practices per the R.S. Means® Facilities Maintenance and Repair Cost Data Handbook. Any time exceeding published labor hours may count towards the outage limit.
- C17.8.E Electrical Repairs. All new electrical repairs, alterations, and modification work that is not classified as a maintenance item or a replacement in kind shall be performed by a State of California certified electrician. All new work shall be ordered under Section C7, Indefinite Delivery Indefinite Quantity Work.

END OF SECTION C17

SECTION C18**LIFTING DEVICES AND EQUIPMENT MAINTENANCE AND REPAIR****C18.1 GENERAL REQUIREMENTS**

C18.1.A General Intention. The Contractor shall provide all labor, supervision, materials, tools, equipment, transportation, and management necessary to provide inspection, testing, certification, maintenance, repair, modification, inventory control, and component replacement services, as required, to maintain built-in (fixed) cranes at NASA Ames Research Center (ARC) and Moffett Airfield Complex (MAC) as listed in Attachment 2.18.01, Section J. Types of equipment include overhead traveling cranes, jib and wall cranes, monorails, hoists, and other lifting devices. Slings, rigging, forklifts, and mobile crane(s) are not included in the firm fixed price portion of this contract. Work will be performed as TC, recurring services, and indefinite delivery indefinite quantity (IDIQ) work per Section C7.2, Indefinite Delivery Indefinite Quantity work; Section C5.2, Firm Fixed Price Work; Trouble Calls. All work shall comply with the appropriate directives, instructions, policies, and regulations listed in Attachment 2.06.01, Section J.

C18.2 DEFINITIONS

Refer to Section C2 and NASA-STD-8719.9, NASA Standard For Lifting Devices and Equipment.

C18.3 GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES

Refer to Section C3.

C18.4 CONTRACTOR FURNISHED ITEMS

C18.4.A Equipment. The Contractor shall supply all appropriate safety equipment, lubricants, cleaners, and spare parts critical to operation of system and provide repair and maintenance as necessary to keep all equipment in good operating condition. The Contractor shall take the following actions regarding:

C18.4.A.1 Safety Equipment. The Contractor shall provide their employees with all safety equipment required to perform the work as stated in this section of the contract.

C18.4.A.2 Lubricants, Cleaners, and Other Chemicals. All lubricants and cleaning agents are to be approved by the NASA Lifting Devices and Equipment Manager (LDEM) prior to use. Lubricants are to be of commercial grade and in accordance with Manufacturer's specifications. If variances from existing materials are recommended for the purpose of improving performance, the Contractor shall verify and ensure compatibility with seals and other fluids prior to use.

C18.4.A.3 Spare Parts. All light bulbs, fittings, hoses, pumps, control valves, and gauges shall be free of visible deterioration, shall not leak, and shall operate at the manufacturer's recommended rates and pressures. Failed equipment shall be replaced and/or repaired by the Contractor prior to resuming operations. Key replacement parts that are inspection or code-required items shall be labeled to indicate the part replacement date.

- C18.4.B Material Storage. All controlled substances used (i.e. fuels, lubricants, cleaners, etc.) shall be labeled and registered by the Environmental Protection Agency (EPA) and stored in accordance with Section C20, Environmental and Emergency Support Services. All substance usage shall be in strict accordance with label directions. Any changes in usage shall have prior written approval of the COTR. The Contractor shall maintain a Material Safety Data Sheets (MSDS) book of all controlled substances to be used and have it readily available at all times at the controlled substances application site.

C18.5 FIXED PRICE WORK

The Contractor shall perform the following contract requirements per the Performance Requirements Summary (PRS), Attachment 3, Section J, at the frequencies or performance criteria specified within the contract requirement. The intent is to provide routine maintenance services that permit the early detection and correction of items that, if deficient or defective, would: (a) Endanger life and/or property; (b) interfere with the normal effective operation of the crane; or (c) incur high cost or long lead time for repair. Accomplish work in accordance with NASA-STD-8719.9 in addition to work described below. The Contractor shall comply with the appropriate directives, instructions, policies, and regulations listed in Attachment 2.06.01, Section J. All projects involving mobile crane use shall be reviewed with the LDEM prior to start of the project located on ARC and MAC property per NASA-STD-8719.9.

- C18.5.A Trouble Calls (TC). The Contractor shall perform TC as required. All TC shall be issued in accordance with Section C5.2, Firm Fixed Price Work; Trouble Calls. The NASA LDEM shall be notified in writing of any TC concerning crane anomalies or deficiencies as they are revealed, or no later than 24 hours upon discovery.

- C18.5.B Contract Requirement No. C18-501, Lifting Devices.

Code Compliance Standard(s) – NASA-STD-8719.9.

Attachment(s) – 2.18.01, Section J, Lifting Devices Inventory

PM Checklists – C18-501, Section J.

The Contractor shall perform PM on all lifting devices included in Attachment 2.18.01, Section J, and in accordance with NASA-STD-8719.9.

- C18.5.C Contract Requirement No. C18-502, Safety Inspection Services.

Code Compliance Standard(s) – NASA-STD-8719.9.

Attachment(s) – 2.18.01, Section J, Lifting Devices Inventory

PM Checklists – C18-502, Section J.

The Contractor shall provide safety inspection services to ensure safety and to support requirements for the continuous certification of all lifting device systems in accordance with Section C5.3.A, Firm Fixed Price Work; Recurring Services; Preventive Maintenance. All inspections and tests shall be performed by or in the presence of a Contractor-provided, qualified crane lead mechanic.

- C18.5.C.1 Hooks and Wire Rope. The Contractor shall visually and physically inspect the material condition of all hooks and wire rope. The Contractor shall inspect all steel cables for fraying, corrosion, and broken strands; all hooks, sheaves, and drums for material condition; and each hook throat opening to verify acceptable tolerances. The Contractor shall verify hook dimensions employing the manufacturer's witness mark, and record any deformations found in hooks and wire rope.

- C18.5.C.2 Structure. The Contractor shall inspect catwalks and handrails for loose or missing hardware, fasteners, and lights; inspect hoist and trolley frames for alignment and missing hardware; install new or missing fasteners and lights found as a result of inspection; tighten all existing fasteners found loose; clean each crane/hoist free of dust, dirt, excess grease, oil, and foreign matter; and clean traveling tracks free of dust, dirt, excess grease, oil, and foreign matter to bare metal.
- C18.5.C.3 Electrical Systems. The Contractor shall open all electrical control panels and inspect and clean contactors, wiring, connections/terminations, relays, all electrical components, controls, and controller boards to ensure that all equipment is free of corrosion, dirt, dust, and foreign matter. The Contractor shall repair or replace any loose wiring/electrical connection, termination, or controlling mechanisms to ensure proper operation.
- C18.5.C.4 Motors and Machinery. The Contractor shall inspect, check, and test holding and load brakes to verify operation in accordance with manufacturer's specifications; inspect gears and bearings for noise, vibration, and wear; lubricate components in accordance with manufacturer's requirements; inspect all oil reservoir levels; install new oil in each reservoir to levels as required by each manufacturer's requirements; and drain the used oil into appropriate containers.
- C18.5.C.5 Outside Cranes. In addition to the requirements above, the Contractor, after inspection, shall ensure that gaskets on motor and control cabinets are firmly in place and all control units are in a secure, watertight condition.
- C18.5.C.6 Operational Inspection and Adjustments. While operating the equipment through its full range, the Contractor shall perform a comprehensive operational inspection to ensure the satisfactory functioning of machinery and controls, trolleys, bridge and hoist brakes, gears and bearings, hooks and wire rope, limit switches and emergency stop switches, conductors, etc.; and detecting and correcting the causes of unusual noises or vibrations. The Contractor shall make any adjustments to bring system operation within the manufacturer's specifications.
- C18.5.D Contract Requirement No. C18-503, Load Testing.
Code Compliance Standard(s) – NASA-STD-8719.9.
Attachment(s) – 2.18.01, Section J, Lifting Devices Inventory
PM Checklists – C18-503, Section J.
The Contractor shall conduct a complete periodic load test to +5/-0 percent for each lifting device listed in Attachment 2.18.01, Section J, on all devices every four years unless deemed to be a critical lift device, which shall be load tested annually.

C18.6 DOCUMENTATION AND REPORTING REQUIREMENTS

- C18.6.A Contract Requirement No. C18-601, Inspection and Testing Monthly and Annual Report. The Contractor shall submit one (1) electronic copy and two (2) hard copies to the COTR documenting all inspections and work performed including specific crane identification, and repair activity containing notation of all problems, discrepancies, failed and marginally passed tests and certifications, and omissions listed with full explanations for any failure to perform (*i.e.* inclement weather conditions or dates). The Contractor shall schedule a review of all discrepancies with the NASA LDEM to be held within five (5) calendar days after submittal. When listing discrepancies, quote the regulation, section, and paragraph where requirement is found in state codes. The Contractor shall submit the annual certification report on each lifting device per Paragraph C18.8.G, Special Requirements.

C18.6.B Contract Requirement No. C18-602, Lifting Devices Maintenance Procedures Plan. The Contractor shall develop a maintenance procedures plan for work on the lifting device systems at ARC. The objective is to perform lifting device work in accordance with written and bound procedures to ensure that they are safe, reliable, and efficient. Two (2) legible hard copies and one (1) electronic copy of the plan shall be submitted to the COTR for approval 90 days after the contract start date. The plan shall incorporate existing ARC documentation, procedures, and standards pertinent to this section. After receiving comments from the Government, the Contractor shall submit a final plan addressing any comments made by the Government and incorporating changes and corrections necessary.

C18.6.B.1 The Plan shall be developed using the following guidelines:

C18.6.B.1.a Manufacturer's instructions.

C18.6.B.1.b NASA-STD-8719.9, NASA Standard for Lifting Devices and Equipment.

C18.6.B.1.c The ARC Safety Manual, Chapter 17.

C18.6.B.1.d Barclays California Code of Regulations, Title 8.

C18.6.B.1.e Industry standards and national codes (American Standards Institute, ANSI, National Fire Protection Association, NFPA, and American Society of Mechanical Engineers, ASME, OSHA 30.0 series, etc.).

C18.6.B.2 The Plan shall address:

C18.6.B.2.a The systems' maintenance procedures including the frequency and description in correct sequence of observations and adjustments to be made.

C18.6.B.2.b Systems testing, inspection, and certification plan and procedures.

C18.6.B.2.c Safety and accident response and reporting procedures.

C18.6.B.2.d A pre-qualified list of subcontractors to provide crane repair services on short notice.

C18.7 INDEFINITE DELIVERY INDEFINITE QUANTITY WORK

Indefinite delivery indefinite quantity (IDIQ) work shall be ordered in accordance with Section C7, Indefinite Delivery Indefinite Quantity Work. Accomplish work in accordance with NASA-STD-8719.9 in addition to work described below. The Contractor shall comply with the appropriate directives, instructions, policies, and regulations listed in Attachment 2.06.01, Section J.

C18.7.A Mobile Crane Safety Inspection and Testing. The Contractor shall perform safety inspection and testing for mobile cranes identical to work requirements and standards of performance specified in Contract Requirement Number C18-502, Safety Inspection Services, and C18-503, Load Testing. In addition, ancillary equipment used for lifting operations is to be inspected (*i.e.* outriggers, leveling devices, steps, etc.). Automotive portions not specifically used for lifting operations are excluded.

C18.7.B Power Equipment Operator, Cranes. The Contractor shall provide a certified crane operator for various lifting operations. The crane operator shall be familiar with all applicable codes and regulations.

- C18.7.C Rigger. The Contractor shall provide a certified crane rigger for various lifting operations. The crane rigger shall be formally trained and familiar with all applicable codes and regulations.

C18.8 DETAILED SPECIFICATIONS

- C18.8.A Work Progression. Work activities (*i.e.* crane certification), once started on a designated piece of equipment, shall be completed as specified prior to proceeding to another area, unless otherwise directed by the COTR.
- C18.8.B Lock-Out/Tag-Out. Install a NASA red lockout tag and follow applicable lock-out, tag-out procedures daily for each lifting device system that fails certification to prevent usage until such time certification can be accomplished. The Contractor shall notify the NASA LDEM on the same day that a device has failed.
- C18.8.C Interferences. The Contractor shall remove and reinstall all interferences necessary to accomplish work required by this section.
- C18.8.D Housekeeping. Contractor shall clean and remove any waste items and debris created by the work performed.
- C18.8.E Hazardous Waste. See Section C20, Environmental and Emergency Support Services. Turn over to NASA all hazardous waste including residual oils and lubricants removed as a result of work performed to a pre-designated waste disposal site.
- C18.8.F Damage Liability. Any work items in this contract, which are damaged as a result of the Contractor's work, shall be repaired or replaced by the Contractor at no additional cost to the Government. The Contractor is also responsible for all damage to private property (*i.e.* employee vehicles), and for any bodily injury resulting from his/her activities.
- C18.8.G Special Requirements. The Contractor shall perform the following before and upon successful certification of the lifting device system:
- C18.8.G.1 Proof Load Test. Before first use and after installation, all new, extensively repaired, extensively modified, or altered cranes shall undergo a proof load test with a dummy load as close as possible to, but not exceeding 1.25 times the rated capacity of the crane. A proof load test also should be performed when there is a question in design or previous testing. The load shall be lifted slowly and in an area where minimal damage will occur if the crane fails. The acceptable tolerance for proof load test accuracy is +5/-0 percent.
- C18.8.G.2 Install at each pendant or local control station a 2-inch by 3-inch aluminum certification tag that denotes the following listed information:
- Certifying activity (company name)
 - License number
 - Crane/hoist identification number (NASA 13 digit)
 - Date certification was accomplished
 - Date of certification expiration
 - Each Critical Lift Crane shall be labeled as such
- C18.8.G.3 Notation in report of any failed conditions, status of lifting device, and recommendations to restore device to operational status. Annual Inventory list shall have separate listings for critical list cranes and inactive/tagged cranes or hoists.

- C18.8.H Deficiencies. Deficiencies discovered during the inspection and testing of lifting devices or during a TC visit shall be corrected as part of each inspection, test, or TC response, with costs not exceeding the trouble call limit for each system. All deficiencies shall be documented and reported to the NASA LDEM within five (5) days of any noted deficiency. All lifting devices shall be rated at original design capacities, speeds, and performance, as appropriate, in a safe and efficient manner. The Contractor shall take whatever remedial action is necessary to ensure the system is code compliant and re-certifiable within five (5) calendar days of failing any certification. This work shall be firm fixed price, except for that beyond trouble call scope, which would be IDIQ using CHUP labor rates.

END OF SECTION C18

SECTION C19**MAINTENANCE ENGINEERING SERVICES****C19.1 GENERAL REQUIREMENTS**

- C19.1.A General Intention. The Contractor shall provide all labor, supervision, materials, tools, equipment, documentation, and management necessary to provide engineering services to support the Plant Engineering Branch operations to parcels at Ames Research Center (ARC), Moffett Airfield Complex (MAC), and designated areas of Moffett Housing Annex 2 as described in Attachment 2.01.04, Section J. Services are to include design, field consultation, recommendations, analysis, oversight and guidance during repair work in progress, and CADD drawings for recurring maintenance repair and collateral equipment replacement. Work will be performed in accordance with Section C5.2, Firm Fixed Price Work; Trouble Calls, Section C5.3, Firm Fixed Price Work; Recurring Services, and Section C7, Indefinite Delivery Indefinite Quantity Work. All work performed by the Contractor shall comply with the latest manuals, industry standards, Federal, State, and local directives, codes, laws and guidelines, and other applicable regulations, directives and instructions including, but not limited to, those listed in Attachment 2.06.01, Section J.

C19.2 DEFINITIONS

Refer to Section C2.

Facility. A term used to encompass land, buildings, other structures, and other real property improvements, including utility systems and collateral equipment. The term does not include operating materials, supplies, special tooling, special test equipment, and non-capitalized equipment. (See Financial Management Manual (FMM) 9255-3 for capitalization criteria for capitalized equipment).

Collateral Equipment. Encompasses building-type equipment, built-in equipment, and large, substantially affixed equipment/property, and is normally acquired and installed as part of a facility project. The word "equipment" as used in this section will mean collateral equipment.

C19.3 GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES

Refer to Section C3.

NPR 8831.2E, NASA Facilities Maintenance and Operations Management

Ames Standard Construction Specifications, latest edition.

APD 8829.1, Construction Permits.

C19.4 CONTRACTOR FURNISHED ITEMS

Refer to Section C4.

C19.5 FIXED PRICE WORK

The Contractor shall perform the following contract requirements per the Performance Requirements Summary (PRS), Attachment 3, Section J, at the frequencies or performance criteria specified within the contract requirement. The intent is to provide on-site maintenance engineering services for repair and replacement operations for facilities, utility infrastructure systems, and collateral equipment as described in the Facilities Maintenance and Operations Management, NPR 8831.2E. All engineering solutions shall provide the most cost effective means of accomplishing the work on the basis of feasibility, functionality, and maintainability. All work by the Contractor shall comply with the latest manuals, industry standards, Federal, State, and local directives, codes, laws and guidelines, and other applicable regulations, directives and instructions including, but not limited to, those listed in Attachment 2.06.01, Section J. For firm fixed price work that requires a permit, the Contractor shall generate all the appropriate documentation and provide management oversight on all required permits. A bid package shall be developed for repair work that exceeds the Trouble Call limit.

C19.5.A Contract Requirement No. C19-501, Maintenance Engineering Support.

Code Compliance Standard(s) – Ames Standard Construction Specifications.

Attachment(s) – 2.19.01, Section J, Project History

PM Checklists – N/A

The Contractor shall provide engineering support services for repair projects and maintenance activities. See project history in Attachment 2.19.01, Section J. The work shall include field consultation and recommendations, analysis such as Pareto, FMEA, and root cause failure, conducting investigations of failures, reviewing specifications and drawings, and developing CADD drawings for the determination of equipment sizing, equipment specifications for improved maintainability and efficiency, required construction, and an evaluation of ancillary equipment.

C19.5.A.1 Field Consultation and Recommendation. The Contractor shall provide any technical assistance required during repair work for all maintenance activities. Solutions shall be practical without compromising safety. The COTR shall be notified if an appropriate solution cannot be achieved in the time frame specified.

C19.5.A.2 Analysis. The Contractor shall provide, as required, engineering analysis in support of all repair functions related to maintenance activities. The analysis may be cursory or detailed as necessary, but is to be comprehensive enough to adequately demonstrate the acceptable working parameters of the items, equipment, or systems. The Contractor shall perform analysis for the purposes of validation and/or verification of facilities and collateral equipment. Should the analysis demonstrate that the item is deficient, an acceptable alternative shall be provided. The engineering staff shall develop and review plans and specifications for optimizing equipment that has a high operating or maintenance cost.

C19.5.A.3 Maintenance Repair Oversight. The Contractor shall provide oversight and management of all maintenance repair work tasked and funded by the Plant Engineering Branch to ensure project success. Work includes managing the budgets, schedules, and performance during the course of effecting repairs to meet the stated objectives.

C19.5.A.4 CADD Drawings. The Contractor shall develop and supply appropriate CADD drawings to support recurring maintenance repair work. Drawings shall be kept in a database accessible to the Government at all times and hard copies reproduced for the purposes of review, meetings, investigations, approval, or documenting as-built conditions.

Drawings shall conform to appropriate ANSI and NASA drawing standards and appropriate industry drawing practices.

C19.5.B Contract Requirement No. C19-502, Design for Replacement of Equipment.

Code Compliance Standard(s) – Ames Standard Construction Specifications; Latest Codes adopted by the NASA Ames Research Center Permit Review Board.

Attachment(s) – 2.19.02, Facility Project Building List

PM Checklists – N/A

The Contractor shall provide engineering design services to support facility projects, infrastructure improvements (all utilities including FMCS and alarm systems), and related engineering studies and investigations required for the replacement of obsolete or failing equipment and systems found at locations listed in Attachment 2.19.02, Section J. The Contractor shall perform facilities, systems, and equipment cost estimating to support all maintenance construction activities. The design shall include a determination of equipment sizing, recommendation of equipment type for improved maintainability and efficiency, required construction activities that require engineering involvement, and an evaluation of ancillary equipment. The Contractor shall generate a bid package that contains, at a minimum, the project scope, complete specifications, any supporting analysis, construction cost estimate, and CADD construction-drawing package. The design package shall comply with industry standards and all Federal, State, and local codes, standards, and guidelines. Up to seven (7) replacement of equipment project designs may be ordered per year by the COTR as part of this requirement.

C19.6 **DOCUMENTATION AND REPORTING REQUIREMENTS**

C19.6.A Contract Requirement No. C19-601, Engineering Documentation Procedures. The Contractor shall develop a documentation system for maintenance engineering services to be maintained throughout the life of the contract. The system shall address the following: Receipt and processing of Plant Engineering Branch requests and project work statements; resource identification and approval; design package processing; project status reporting; record keeping and documentation; project coordination; Government progress reviews and approval; resolving technical, safety, red-lined drawing comments, and hazardous issues; and any other appropriate procedure for standardizing the processing of these services in a cost effective manner. The Contractor shall maintain a copy of all documentation from system inspections, detailed flow charts, meetings, safety records, tests, design packages, analysis, and CADD drawings performed throughout the life of the contract. All CADD drawings shall be submitted to Engineering Document Control (EDC) upon final completion of a project. All documentation shall be the property of NASA and shall be provided to the COTR upon request throughout the contract period.

C19.6.B Contract Requirement No. C19-602, Engineering Reports. The Contractor shall provide technical and cost information obtained from daily maintenance operations including, but not limited to, surveys, construction, analysis, testing and certification, or problems noticed during technical assistance of maintenance support work. When listing discrepancies, quote the regulation, section, and paragraph where requirement is found in code or regulation nomenclature. Submit an electronic copy weekly with any applicable hard copy attachments to the COTR for review, budget planning, and/or consideration for approval of future repairs.

C19.7 **INDEFINITE DELIVERY INDEFINITE QUANTITY WORK**

Indefinite delivery indefinite quantity (IDIQ) work shall be ordered in accordance with Section C7, Indefinite Delivery Indefinite Quantity Work. All work performed by the Contractor shall comply with the latest manuals, industry standards, Federal, State, and local directives,

codes, laws and guidelines, and other applicable regulations, directives and instructions including, but not limited to, those listed in Attachment 2.06.01, Section J. All engineering solutions shall provide the most cost effective means of accomplishing the work on the basis of feasibility, functionality, and maintainability. For IDIQ work that requires a permit, the Contractor shall generate all the appropriate documentation that is required for the Permit Review Board process and obtain the construction permit as part of the scope of work.

- C19.7.A Engineering Design and Construction Services. The Contractor shall provide engineering design services to support facility projects and related engineering studies required for program development. Engineering disciplines shall include, but not be limited to, all areas as defined in this section. The Contractor shall provide construction management services (including permit generation and follow-through), surveying, cost estimating, designs, traffic studies, fire protection systems engineering, engineering analysis including structural, drawings, photographic and video documentation, and project scheduling for government initiated construction projects. The Contractor shall perform all aspects of construction management, and acceptance of construction contracts implemented by others and assigned to the Contractor for construction services. The design shall include a determination of equipment sizing, recommendation of equipment type for improved maintainability and efficiency, required construction, and an evaluation of ancillary equipment. The Contractor shall generate a bid package that contains, at a minimum, the project scope, complete specifications, any supporting engineering analysis, and CADD construction-drawing package. The bid package shall comply with industry standards and all Federal, State, and local codes, standards, and guidelines.

C19.8 DETAILED SPECIFICATIONS

- C19.8.A Personnel Qualifications. Personnel shall have the education, training, licenses, certifications and experience required by Federal, State, and local authorities and at least equivalent to prevailing industry practice. See Section C1.2.P.10, General Information and Requirements; Scope of Work; Contractor Licensing, Certification, and Specific Experience Requirements; Engineers, for educational requirements.

- C19.8.A.1 Engineering Staff. The engineering staff shall have a cumulative background in the following commercial and industrial applications: Electrical systems, mechanical systems (*i.e.* HVAC/R, pumps, compressors, etc.), alarms and controls, utility distribution systems (*i.e.* steam plants, water, gas, electrical, storm drains and sewers, etc.), building structures, general construction practices, and familiarity with applicable regulatory codes. Engineers shall be able to read and interpret construction drawings, be cognizant of RCM strategies and practices, and have the ability to produce engineering sketches. The lead engineer shall hold a current license with the California Board for Professional Engineers and Land Surveyors, and be actively practicing in the subject field.

- C19.8.A.2 Drafters and Technical Support Personnel. Personnel shall have a familiarity with all the background areas as described above. Drafters shall have experience in CADD (*i.e.* AutoCad) and hand-drafting practices, along with familiarity of codes, industry standards, and all applicable mechanical, structural, construction, and architectural drafting practices including the ability to produce professional construction drawings and specifications. The lead drafter shall have experience as a drawing checker.

END OF SECTION C19

SECTION C20**ENVIRONMENTAL AND EMERGENCY SUPPORT SERVICES****C20.1 GENERAL REQUIREMENTS**

- C20.1.A General Intention. The Contractor shall establish and maintain internal environmental compliance controls encompassing both management and functional responsibilities for its own operations only at Ames Research Center (ARC) and Moffett Airfield Complex (MAC), and provide emergency support services as required to support agency disaster response activities. The work performed under this contract shall include, but is not limited to, providing timely responses and appropriate corrective or remedial actions, as required, to address Environmental Safety and Health (ESH) and emergency support requirements; and designating responsibility for prevention, control, and abatement of environmental pollution to appropriate individuals. All work performed under this contract shall be done in conformance with applicable ESH statutes, orders, and regulations including APR 8800.3 as well as Federal, State, and local statutory and regulatory requirements in addition to NASA agency level requirements and policies. The Contractor shall notify the Government in accordance with required timelines prior to operation, whenever an operation will result in the storage of hazardous materials, emission of pollutants or contaminants, generation of hazardous waste, or have an effect on protected natural or cultural resources. The Contractor shall inspect hazardous materials storage locations including above ground tanks, maintain documentation of these inspections, store all liquid hazardous materials in secondary containment, track and record the amount of wastewater that is pumped, treated, or discharged, and keep current Material Safety Data Sheets (MSDS) files and records. All records shall be legible and maintained in an orderly fashion.
- C20.1.B Planning. The Contractor shall develop plans, drawings, work statements, specifications, and/or other product descriptions involving ESH management. The following factors shall be considered during planning: (1) Elimination of virgin material requirements; (2) use of recovered materials; (3) reuse of products; (4) life cycle costs; (5) recyclability; (6) use of environmentally preferable products; (7) waste prevention (including toxicity reduction or elimination); and (8) ultimate disposal, as appropriate. These factors shall be considered in acquisition planning for all procurements and in the evaluation and award of subcontracts, as appropriate.
- C20.1.C Responsibility. ALL Contractor employees shall be responsible for the following:
- C20.1.C.1 Conducting work in compliance with all applicable ESH requirements, including attending all required training courses.
- C20.1.C.2 Reporting identified ESH protection problems through Contractor line management to the Government.
- C20.1.C.3 Providing support, guidance, and assistance to its employees in interpreting ESH policies, requirements, and standards, including the preparation of plans and reports where applicable.
- C20.1.D Remediation and Composting Services. The Contractor shall be responsible for remediation of diesel hydrocarbon impacted soils to facilitate the reduction of the average levels of total petroleum hydrocarbons as diesel (TPHD) to less than 400 parts per million (ppm), as specified by an analytical method in accordance with Paragraph C20.8.C, Detailed Specifications; Analytical Method. The Contractor shall be responsible for composting of green, brown chipped, and shredded materials. All activities shall be located at the soil remediation pad on the former Vertical Take-Off and Landing (VTOL) pad on ARC property, at another on-site location, or as otherwise specified by the Government.

C20.1.E Hazardous Materials Services. The Contractor shall provide personnel to support the Hazardous Material Services internal operations and for Plant Engineering Branch related projects and activities only. See Section C1.2.P.3, Environmental Safety and Health Management, for Contractor Licensing, Certification and Specific Experience Requirements. Centerwide services will be provided by others. The work shall entail those items listed in Paragraph C20.1, General Requirements.

C20.2 DEFINITIONS

Refer to Section C2.

Bio-nutrient. Microbial nourishment consisting of composted material.

Shovel Clean. All debris that can be removed by a flat-faced or flat-surfaced shovel.

Illicit Connection. Wastewater drainage plumbed to the storm drain system that should be plumbed to the sanitary sewer system.

Industrial Wastewater. Water from any production, manufacturing, or processing operation of any nature, including institutional and commercial operations, where wastewater is used for the removal of waste other than domestic waste. This shall include contaminated water from construction operations, contaminated water from erosion of disturbed land, and contaminated water from irrigation run-off.

Wildcat. Compost turner attachment to a front-end loader.

Windrow. A row of vegetation and/or soil constructed by mechanical means.

C20.3 GOVERNMENT FURNISHED PROPERTY, MATERIALS AND SERVICES

Refer to Section C3. However, the Government will provide limited surplus office furniture and vehicles to the Contractor for personnel use under this section.

C20.4 CONTRACTOR FURNISHED ITEMS

Refer to Section C4.

C20.5 CONTRACT WORK ELEMENTS

C20.5.A Trouble Calls (TC). All packaging and transporting of hazardous waste/substances at ARC and MAC shall be performed by the Contractor as TC. Packaging and transport of hazardous waste/substances from one (1) location will be considered as one (1) TC. The Contractor shall provide all other items required to support the packaging and transport effort. The Contractor shall transport all hazardous waste to the on-site hazardous substances transfer site located at Building 265 on ARC property. No hazardous waste shall be transported off Moffett Field property. Any incidental cleanup required when packaging or transporting hazardous waste/substances shall be a part of the TC. Hazardous Waste/Hazardous Material Generation Historical Data is shown in Attachment 2.20.08, Section J.

C20.5.B Contract Element No. C20-501, Hazardous Waste/Substance Services.

The Contractor shall provide hazardous waste/substance services within ten (10) minutes upon notification by the Customer Service Center or the Government during normal working

hours and within one (1) hour at all other times. The Contractor shall be notified by telephone or in person whenever required to respond to these incidences. Once begun, the Contractor shall not leave the job site until all work has been completed and the waste/substance has been packaged, and properly transported to an on-site hazardous waste packaging or accumulation facility.

- C20.5.B.1 Hazardous Waste/Substance Spill Cleanup. The Contractor shall clean up or assist in the clean up of all hazardous waste/substance spills that are directly related to maintenance related activities only. For all other spills, the Contractor may provide oversight and technical expertise to the clean-up activities provided by others. A contact person shall be available on a 24-hour, seven (7) day per week basis. The Contractor shall work continuously to contain and clean up the spill and package the material. The Contractor shall not leave the site until all work is completed. The Contractor shall maintain a spill log on the site and write down all significant events and the times that they occurred. Any notes taken during the spill clean up shall be provided to the COTR with the report of the spill.
- C20.5.B.2 Types of Spills. Hazardous waste/substance spills may include, but not be limited to: Automobile gas, fuel oil, diesel oil, jet fuel, transformer oil, hydraulic and lube oils, PCBs, paint-related materials, asbestos and lead particulate matter, and solvents.
- C20.5.B.3 Spills That Escape Secondary Containment. Spills that enter the environment, including soil, surface water, ground water, sanitary sewer, or storm drain, shall be immediately reported by dialing 911 from any on-site telephone, or (650) 604-5555 from any off-site or cellular phone.
- C20.5.B.4 Programmatic Requirements. The Contractor shall provide programmatic oversight, regulatory compliance and assurance, and documentation of procedures, policies, and reports. Requirements include analysis of regulatory requirements for hazardous material response, establishment of policies and response procedures to meet the requirements, preparation of post-incident documentation, documentation of interface and support agreements with other elements of NASA or with other site contractors tasked to provide hazardous material response related services, and filling out standard reports for the Government on each incident. Excluded work includes: 1) Direct interface with or representation of NASA to Government regulatory agencies; 2) Liability for injury to non-contractor personnel or damage to Government or personal property arising from the initial release of hazardous materials; 3) Responsibilities and liabilities associated with being the "waste generator" on any regulatory permits; and 4) Provision of Industrial Hygiene services such as assessments of atmospheric conditions, radiation safety, health impact assessments, etc.
- C20.5.C Contract Element No. C20-502, Cleanup Assistance.
The Contractor shall assist in emergency response cleanup of all non-hazardous materials spills that are directly related to maintenance activities only. For all other spills, the Contractor may provide oversight and technical expertise to the clean-up activities provided by others. If required, the Contractor shall be responsible for all costs incurred up to the TC limit. If the clean up is over the TC limit, the work over the TC limit shall be ordered as an IDIQ item per Section C7, Indefinite Delivery Indefinite Quantity Work.
- C20.5.D Contract Element No. C20-503, Pumping and Piping for Processed Water.
The Contractor shall provide support for remediation systems such as pump and treatment of processed water from boilers, cooling towers, and chillers through the Resin Filtration Unit. Following filtration, the Contractor shall contact and schedule with the Government for testing of pH, metal content, and final disposition. See Attachment 2.20.07, Section J, for information about water treatment through the Resin Filtration Unit and proper disposal of

water. All records shall be kept in a neat and orderly fashion per Contract Requirement No. C20-601, ESH Plan.

C20.5.E Contract Element No. C20-504, Settling Basin Annual PM.

The Contractor shall drain and shovel clean the storm-water settling basin near Building 249 annually. All booms shall be replaced with like kind annually or on an as-needed basis. Inlet pipes shall be shut off at the valves prior to pumping. The Government shall provide sediment testing. After testing is complete, the Contractor shall load sediment into Government provided bins, or if non-hazardous, the Contractor shall dispose of the sediment off-site at a designated approved landfill.

C20.5.F Contract Element No. C20-505, Pumping Electrical/Communication Vaults.

The Contractor shall pump out electrical and communication vaults that collect ground water on a routine basis before they reach the switchgear equipment located inside the vaults. Discharge of water collected from these vaults to the storm drain system is strictly prohibited unless waived by the Government. The Contractor shall contain water for Government sampling. Contaminants may include oil and grease, heavy metals, volatile organics, and other chemicals that render it unsatisfactory for discharge to the ground, storm drain, or sanitary sewer system. The Contractor shall have emergency procedures available for contractor provided containment if water cannot be discharged to the sanitary sewer or Baker tanks. The Contractor shall coordinate pumping of utility access vaults and sumps with the Government. Open and vent access utility vaults if the vault contains high voltage cables or equipment. Position the hose away from the cable insulation prior to starting. Monitor the hose and couplings for leakage. All leaks must be repaired or the operation shall cease. Utility access vaults located on the City of Sunnyvale area shall be discharged to the Baker Tank located near Building 245. All utility access vaults located on the City of Palo Alto area shall be discharged at a point designated by the Government. See Attachment 2.20.04, Section J, for area designations of utility vaults. All pumping operations shall be recorded and kept in an orderly fashion per Contract Requirement No. C20-601, ESH Plan.

C20.5.F.1 City of Palo Alto Sanitary Sewer Discharge. Water collected from vaults located within the area of the site served by the City of Palo Alto shall be containerized when any of these three conditions exist: 1) The area is in the existing underground plumes; 2) The area is in an Area of Investigation (AOI); or 3) The water has an odor or oily sheen. If none of the above is true, the wastewater may be discharged into the sanitary sewer system after Government approval.

C20.5.F.2 City of Sunnyvale Sanitary Sewer Discharge. Water collected from vaults located on MAC property shall be contained in a designated Baker tank to be present on-site at all times. When the tank is half full, notify the Government so that sampling by the Government can take place. All groundwater pumped from utility vaults located in the Moffett-Ellis-Whisman (MEW) plume shall be contained in Baker tanks located near Building 245 that is managed by the ARC Environmental Management Division. See Attachment 2.20.04, Section J, for area and vault locations.

C20.5.G Contract Element No. C20-506, Bio-remedial Treatment Windrow Construction.

The Contractor shall construct each windrow to be ten (10) feet wide by five (5) feet high and 160 feet long, giving each windrow an estimated volume of 296 cubic yards. The soil remediation pad shall hold eight (8) windrows for a total estimated capacity of 2,368 cubic yards. See Attachment 2.20.02, Section J, for location and dimensions of the soil remediation pad. The Contractor shall provide protection of windrows to prevent migration of leachate and scattering off of the pad using a method, such as berming, utilizing on-site soil with plastic sheets around the perimeters for areas where a berm does not exist. Additionally, storm water, if encountered, shall be delivered to a collection terminus, where it shall then be pumped to an on-site storage container for later re-application to the soils. The Contractor shall ensure adequate delivery of soil exposure to the bio-nutrients and water.

C20.5.H Contract Element No. C20-507, Stockpiling of Soil Onto Pad.

The Contractor shall load the stockpiled or drummed soils onto the soil remediation pad. Upon completion of the initial staging, and depending on environmental conditions, the exposed soil may be covered with tarps between bio-remedial treatment visits to facilitate heat and moisture in the treated soil. The Contractor is responsible for picking up the soil at various locations on-site and delivering them to the remediation pad area.

C20.5.J Contract Element No. C20-508, Stockpiling of Soil Off the Pad.

The Contractor shall establish a staging area with concurrence from the Government for any excess soil that cannot be put on the soil remediation pad. The soil shall be placed upon six (6) mil polyethylene and bermed and covered to prevent run-off. The Contractor is responsible for picking up the soil at various locations on-site and delivering them to the remediation pad area.

C20.5.K Contract Element No. C20-509 Application of Bio-nutrients.

The Contractor shall apply appropriate bio-nutrients uniformly to the existing piles of soil on the pad. On-site landscape compost shall be used. The Contractor shall apply rates and volumes to provide sufficient levels of nutrients in an environment of 30 to 40 percent field capacity moisture. Frequency of nutrient applications shall be based upon several factors such as evaporative loss of water, microbial nutrient utilization rates, etc. Approximately 100 cubic yards of bio-nutrient is required per windrow. Subsequent to each nutrient application, soil mixing/scarification shall be provided via the loader with "Wildcat" attachment. Such mixing is essential in order to ensure relative nutrient homogeneity within soils, maximized subsurface oxygenation, and optimal interaction among microorganisms, nutrients, and contaminants. Bio-remedial treatment as described above shall continue until total petroleum hydrocarbon levels have been reduced to acceptable levels. The bio-remediated soil shall be transported to sites on Moffett Field designated by the Government.

C20.5.L Contract Element No. C20-510, Monthly Soil Sampling and Analysis.

The Contractor shall collect and analyze monthly soil samples on the remediation pad(s) to document the degradation of the petroleum hydrocarbons and to monitor biological treatment parameters. All sample locations and laboratory data will be documented and kept in an orderly manner. For final characterization, one (1) discreet soil sample shall be taken for approximately every 20 cubic yards of soil or at current guideline frequencies as determined by the Government.

C20.5.M Contract Element No. C20-511, Weekly Bio-process Monitoring.

The Contractor shall take weekly moisture and temperature readings from the compost windrows and record results in a legible manner and maintain a written log including date and time.

C20.5.N Contract Element No. C20-512, Composting Material.

The Contractor shall chip and shred all stockpiled landscaping material provided by the landscapers. Maintain log on the tub grinder of operational hours per BAAQMD regulations. The Contractor shall mix the chipped and shredded landscape material into compost windrows. The Contractor shall add water and monitor temperature and moisture to optimize conditions. The Contractor shall provide a trained operator for the "Wildcat" loader attachment to mix/aerate the compost. The windrows shall be removed from the composting pad and stockpiled in a material holding area. The Contractor shall utilize compost material in the bioremediation process and/or make chipping and compost material available to the landscapers working at Moffett Field.

C20.5.P Contract Element No. C20-513, Logistics Support.

- C20.5.P.1 The Contractor shall maintain and operate as required all equipment stored at the DART Operation Buildings (DOB), and all related structures within the DOB site. The Contractor shall manage use of the DOB training facility for DART, and manage and maintain the collapsed structure rescue training facility.
- C20.5.P.2 The Contractor shall maintain Government inventory of response and recovery equipment and resources.
- C20.5.P.3 The Contractor shall develop estimates for emergency equipment and resources.
- C20.5.P.4 The Contractor shall maintain and monitor designated emergency equipment and vehicles in a ready state of use.
- C20.5.P.5 The Contractor shall provide logistics support for disaster preparedness, response and recovery exercises, and drills.
- C20.5.P.6 The Contractor shall track equipment issued to Emergency Response Team members and supplemental staff.
- C20.5.P.7 The Contractor shall maintain written maintenance records for life safety equipment.
- C20.5.P.8 The Contractor shall maintain equipment certifications.

C20.5.Q Contract Element No. C20-514, Emergency Response.

- C20.5.Q.1 Damage and Utility Control Team (DUCT). The Contractor shall provide a core compliment of personnel who are trained and certified in emergency response as damage and utility control specialists. This team of specialists will be referred to as the Damage and Utility Control Team (DUCT). The number of personnel trained as DUCT members shall be determined by the Contractor, based on the number of personnel in the maintenance/repair workforce. At least 30 percent of the maintenance and repair personnel shall be trained and certified in emergency response as damage and utility control specialists.
- C20.5.Q.2 DUCT Training and Certification. DUCT members shall be certified in Emergency Response Team (ERT) Training and trained to the hazardous material industrial technician level per 29 CFR 1910 - 120. Members shall maintain certification on an annual basis, and will participate in NASA sponsored drills on a quarterly basis. ERT training is certified by the State of California and involves attending an intensive training class for 40 hours in emergency response. In addition, all DUCT members shall attend quarterly training exercises (maximum of 6 hours per quarter) sponsored by NASA. The annual re-certification is a 24-hour refresher course certified by the State of California. It is the responsibility of the Contractor to ensure that all DUCT members are properly trained and certified by the end of the first year from contract start date.
- C20.5.Q.3 DUCT Response. The Contractor shall respond to all emergencies and disasters at Moffett Field only when the Emergency Operations Center (EOC) is activated and requires assistance. This shall include all actual events and exercises and training activities that the EOC is actively participating in.

C20.6 DOCUMENTATION AND REPORTING REQUIREMENTS

- C20.6.A Contract Element No. C20-601, ESH Plan. The Contractor shall develop and implement a written ESH plan for employees involved in hazardous operations to be incorporated as part of this contract as the Safety and Health Plan, Attachment 9, and the Environmental

Protection Summary, Attachment 10. The ESH plan shall include: 1) an organizational structure; 2) a comprehensive work plan for all work involved under this contract; 3) specific discussion about pumping electrical and communication vaults; 4) specific discussion about usage and maintenance of the resin filtration system; and 5) specific discussion concerning protection of various wildlife species living on the Center. The plan shall be designed to identify, evaluate, and control safety, health, and environmental hazards, and provide for emergency response for hazardous waste or material operations.

The initial ESH plan will be incorporated as part of this contract from the proposal. The Government will review this plan prior to contract start and during the Phase-In period of the Base Period, and provide feedback to the Contractor to address any deficiencies or corrections. After receiving comments from the Government, the Contractor shall submit a final plan within 60 days addressing any comments made by the Government and incorporating changes and corrections necessary. The ESH plan shall be updated annually. The ESH plan shall address the following:

- C20.6.A.1 Organizational Structure. Outline the specific chain of command and specify the overall responsibilities of supervisors and employees. The organizational structure shall include, as a minimum, the following elements:
 - C20.6.A.1.a A general supervisor who has the responsibility and authority to direct all hazardous waste/material operations in cooperation with the Government.
 - C20.6.A.1.b A safety and health supervisor who has the responsibility and authority to develop the site safety and health plan and verify compliance in cooperation with the Government.
 - C20.6.A.1.c Other personnel required for hazardous waste/material site operations and emergency response and their general functions and responsibilities.
 - C20.6.A.1.d The lines of authority, responsibility, and communication.
- C20.6.A.2 Comprehensive Work Plan. The ESH plan shall address the tasks and objectives of the site operations and the logistics and resources required to accomplish those tasks and objectives in compliance with all applicable safety and environmental laws and regulations.
 - C20.6.A.2.a The ESH plan shall address anticipated clean-up activities (especially hazardous waste) as well as normal operating procedures that are not addressed elsewhere.
 - C20.6.A.2.b The ESH plan shall define work tasks and objectives and identify the methods/procedures for accomplishing those tasks and objectives in a safe and efficient manner being cognizant of building occupancy, facility usage requirements, and surrounding habitats.
 - C20.6.A.2.c The ESH plan shall establish personnel requirements for implementing the plan.
 - C20.6.A.2.d The ESH plan shall identify and provide for the implementation of the training required.
- C20.6.A.3 Pumping Electrical and Communication Vaults. Utility access vaults that are pumped shall be logged with the vault number, date, time of pumping, approximate gallons, pH, visual inspection noting oily sheen or unusual smell, discharge point, heavy metals analyticals, and time of discharge. Prior to discharge, the wastewater must comply with POTW limits as specified in the discharge permit. All records shall be maintained in a neat and orderly fashion and provided upon request to the Government.

- C20.6.A.4 Resin Filtration System. All water that is processed through the Resin Filtration System shall be logged by date, time, origin of the water, pH, gallons, heavy metals analyticals, and final disposition. Prior to discharge, the wastewater must comply with POTW limits as specified in the discharge permit. All records shall be maintained in a neat and orderly fashion and provided upon request to the Government.
- C20.6.B Contract Element No. C20-602, Annual Pollution Prevention Plan. The Contractor shall develop and submit an annual pollution prevention plan for the control of environmental pollution to both the COTR and the distribution listed in Section C6, Documentation and Reporting Requirements Summary. The first plan is due no later than 1 August, and annually thereafter.
- C20.6.C Contract Element No. C20-603, Annual Solid Waste Prevention and Recycling Goals. The Contractor shall establish a goal for solid waste prevention and a goal for recycling to be achieved by the end of each calendar year. The goals shall not be less than required by NASA or the Santa Clara County solid waste reduction requirements. A report shall be submitted to both the COTR and the distribution listed in Section C6, Documentation and Reporting Requirements Summary. The first report is due no later than 1 June, and annually thereafter.
- C20.6.D Contract Element No. C20-604, CFC and HCFC Monthly Reports. The Contractor will not be responsible for completing reports required by the EPA pertaining to CFCs and HCFCs. However, all CFCs and HCFCs used for any maintenance operation or contract task order work shall be logged by the Contractor noting date, location, all usage of equipment identified including capacity and recovery equipment, pounds of refrigerant, estimated loss, amount recovered, and person(s) performing work. All work, including usage and handling on equipment containing CFCs and HCFCs shall be in accordance with the latest Federal, State, and local standards and regulations. All CFCs and HCFCs shall be reclaimed when work is performed on equipment containing such chemicals and reused when applicable. The Contractor shall store CFCs and HCFCs for use on NASA-owned equipment that is pertinent to this contract. A monthly report shall be submitted to the COTR summarizing the logged information for each type of equipment.
- C20.6.E Contract Element No. C20-605, Hazardous Material Inventory and Tracking Report.
- C20.6.E.1 The Contractor shall track and report quarterly to both the COTR and the distribution listed in Section C6, Documentation and Reporting Requirements Summary, the volume of each hazardous material procured, used, abated, and inventoried (*i.e.* asbestos, oils, solvents, paints, etc.). All MSDSs of all chemicals to be used on this contract shall be submitted to the COTR for approval 15 calendar days prior to start of the Base Period, and as modifications occur during the contract period.
- C20.6.E.2 For spills that occur under Contract Element No. C20-501, Emergency Hazardous Waste/Substance Services, the Contractor shall immediately notify the COTR of the occurrence and follow-up in writing within 24 hours a summary status of occurrence including procedures implemented and any known quantities spilled and/or recovered. The Contractor shall submit one (1) electronic summary report to the COTR monthly on each hazardous waste/substance spill that occurred during the month. The report shall include the time when first notified of the spill, the start and finish times for clean-up, type of material, amount collected, personnel involved in handling the clean-up material, and any additional information required by Federal, State, and local regulations.
- C20.6.F Contract Element No. C20-606, Remediation Activity Report. Upon analytical verification that soil remediation has been completed, a final report shall be prepared by the Contractor and submitted to the COTR no later than one (1) week after remediation is complete. The report shall summarize all remedial activities performed including, but not limited to, supporting documentation such as field logs, laboratory sheets, and NASA soil permits received.

C20.6.G Contract Element No. C20-607, Soil Sample Results Monthly Report. The Contractor shall submit a monthly soil sample report to the COTR containing all activities concerning soil remediation and composting including temperature and moisture readings. The Contractor shall maintain all records in a neat and orderly fashion.

C20.6.H Contract Element No. C20-608, Tub Grinder Operating Hours Report. The Contractor shall submit a report electronically to the COTR per the BAAQMD regulations showing the operating hours of the tub grinder maintained under this contract. Show current month usage along with total hours operated since activation.

C20.7 INDEFINITE DELIVERY INDEFINITE QUANTITY WORK

For Environmental and Emergency Support Services requirements beyond the requirements set forth in this section, the Government will order Indefinite delivery indefinite quantity (IDIQ) work in accordance with Section C7, Indefinite Delivery Indefinite Quantity (IDIQ) Work, and completed within the number of calendar or work days specified in the contract task order. The Government will order these items only if they are above and beyond the normal work requirements stated in this section. Items such as asbestos and lead abatement of large continuous areas would be examples of work beyond the normal work requirements of this section.

C20.7.A Asbestos Abatement. The Contractor shall perform asbestos abatement in accordance with the ARC Asbestos Management Plan, Chapter 30 of the Ames Health and Safety Manual, APR 1700.1, as revised. All jobs shall be documented and files kept in an orderly fashion for review by the Government at all times. A report shall be submitted to the Government on all abatement jobs performed. The documentation shall include logs specifying an estimated amount of asbestos removed (in linear square feet). Typical abatement work includes roofing, tile, mastic, pipe insulation, sheetrock, and plaster.

C20.7.B Lead Abatement. The Contractor shall perform lead abatement that complies with the Federal OSHA lead Construction Standards Title 8 Chapter 4 Section 1532.1 and 29 CFR 1926.62, and Ames procedures and guidelines. All jobs shall be documented and files kept in an orderly fashion for review by the Government at all times.

C20.7.C Hazardous Materials Specialists. The Contractor shall provide resources to perform hazardous materials work in accordance with all NASA and other Federal, State, and local codes and regulations.

C20.8 DETAILED SPECIFICATIONS

C20.8.A Environmental Protection. The Contractor shall comply with all environmental directives, instructions, policies, and regulations as listed in Attachment 2.06.01, Section J.

C20.8.A.1 Hazardous Materials. All hazardous materials shall be stored, used, and disposed of in accordance with Federal, State, and local environmental laws and regulations listed in Attachment 2.06.01, Section J.

C20.8.A.1.a Asbestos. All potential material that may contain asbestos shall be tested prior to removal work being performed.

C20.8.A.1.b Lead. All painted surfaces that may contain lead shall be tested prior to removal work being performed.

C20.8.A.1.c PCB Ballasts and PCB Contaminated Oils. All PCB ballasts or ballasts that are not marked as non-PCB containing and PCB contaminated oils shall be treated

- as hazardous waste. See Attachment 2.20.09, Section J, for detailed procedures.
- C20.8.A.1.d Fungi. All fungi and fungi contaminated materials shall be cleaned up and disposed of in accordance with NASA and other Federal, State, and local environmental laws and regulations.
- C20.8.A.1.e Bird and Rodent Droppings. All bird and rodent droppings shall be cleaned up and disposed of in accordance with NASA disinfecting procedures.
- C20.8.A.2 Storm Drain Discharge. No items shall be directly discharged into the storm drain system except rainwater, fire hydrant water, and exterior building wash downs performed with potable water only. All wastewater produced by mopping and cleaning activities shall be disposed of into the sanitary sewer system.
- C20.8.B Permits. The Contractor shall provide all necessary supporting data to NASA to complete applications and obtain the required permits. The Government shall be notified prior to installation of or removal of equipment containing hazardous materials. Work shall not take place until the Government is notified and provided with the required information. Receipt of a NASA Ames Excavation/Soil Disposal Permit will be required for remediation of contaminated soil. See Attachment 2.20.03, Section J, for samples of all permits required for this paragraph.
- C20.8.C Analytical Method. The modified EPA 8015 or EnSys Field Kit US EPA SW-846 Immunoassay Methods 4010, 4020, 4030, and 4035 may be used to test soil samples, or any certified laboratory that accepts soil test samples for analysis.
- C20.8.D Training. All hazardous material specialists shall be trained in various testing and heavy vehicle equipment which shall include, but not be limited to, the following:
- C20.8.D.1 Testing Equipment
- Haz-cat Chem ID Kit
 - FiD/PiD
 - Anion/Cation Water Purification Systems
 - Gas Tech
 - Sensidyne
 - Combustible Gas Indicator (CGI)
- C20.8.D.2 Heavy Vehicle Equipment
- Dump Truck
 - Tractor Trailer
 - Grader
 - Rotor Separator
 - Front End Loader
 - Wildcat Compost Turner attachment to a front-end loader
 - Fork Lifts (up to 34K rated lifting capacity)
- C20.8.D.3 Logistics Specialist
- HazWOPER
 - Fork Lifts (up to 34K rated lifting capacity)
- A minimum of two (2) hazardous material specialists shall have and maintain a Class A License throughout the life of the contract.
- C20.8.E Cost Plus Personnel. All personnel who are part of the cost plus fixed fee basis of this contract shall not be considered as contributing to the cost billed to the Government of any

fixed price work requirement under the fixed price portion of this contract. Any work required by cost plus fixed fee personnel in support of a TC, PM, or fixed price work requirement shall be billed as part of the cost plus portion of this contract. However, the hours incurred shall be reported with the work order for annotation purposes only. For IDIQ contract task orders defined in Paragraph C20.7; Indefinite Delivery Indefinite Quantity Work, the cost will be billed directly to each individual contract task order except for maintenance related orders under the TC limit that are directly related to the Plant Engineering Branch funded activities.

END OF SECTION C20